

**BEFORE THE  
PUBLIC SERVICE COMMISSION  
OF SOUTH CAROLINA**

**DOCKET NO. 2019-290-WS**

**In the Matter of:**

**Application of Blue Granite Water  
Company for Approval to Adjust  
Rate Schedules and Increase Rates**

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**REBUTTAL TESTIMONY OF  
DYLAN W. D'ASCENDIS FOR  
BLUE GRANITE WATER COMPANY**

## TABLE OF CONTENTS

	<b>Page</b>
<b>I. INTRODUCTION.....</b>	<b>2</b>
<b>II. PURPOSE OF TESTIMONY.....</b>	<b>2</b>
<b>III. SUMMARY .....</b>	<b>3</b>
<b>IV. UPDATED ANALYSIS.....</b>	<b>4</b>
<b>V. RESPONSE TO MR. PARCELL.....</b>	<b>5</b>
<i>A. Significant Weighting of DCF Results .....</i>	<i>5</i>
<i>B. Application of the CAPM.....</i>	<i>12</i>
<i>C. Application of the CEM .....</i>	<i>24</i>
<i>D. Adjustments to the Indicated Common Equity Cost Rate .....</i>	<i>31</i>
<i>E. Response Mr. Parcell's Criticisms of Company Direct Testimony .....</i>	<i>38</i>
<b>VI. RESPONSE TO MR. ROTHSCILD.....</b>	<b>42</b>
<i>A. Current Market Environment.....</i>	<i>43</i>
<i>B. Application of the DCF Model.....</i>	<i>53</i>
i. Significant Weighting of DCF Model Results .....	53
ii. Application of the Constant Growth DCF Model.....	54
iii. Application of the Non-Constant Growth DCF Model.....	62
<i>C. Application of the CAPM.....</i>	<i>65</i>
<i>D. Adjustments to the Cost of Common Equity.....</i>	<i>69</i>
<i>E. Response to Mr. Rothschild's Criticisms of Company Testimony.....</i>	<i>70</i>
<b>VII. CONCLUSION .....</b>	<b>72</b>

1   **I. INTRODUCTION**

2   **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3   A. My name is Dylan W. D'Ascendis. My business address is 3000 Atrium Way, Suite 241,  
4   Mount Laurel, NJ 08054.

5   **Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

6   A. I am a Director at ScottMadden, Inc.

7   **Q. ARE YOU THE SAME DYLAN W. D'ASCENDIS THAT PROVIDED DIRECT**  
8   **TESTIMONY IN THIS PROCEEDING?**

9   A. Yes, I am.

10   **II. PURPOSE OF TESTIMONY**

11   **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY IN THIS**  
12   **PROCEEDING?**

13   A. The purpose of my rebuttal testimony is two-fold. First, I will update my recommended  
14   weighted average cost of capital ("WACC"), including my recommended return on  
15   common equity ("ROE"). Second, I will respond to the direct testimonies of David C.  
16   Parcell, witness for the South Carolina Office of Regulatory Staff ("ORS") and Aaron L.  
17   Rothschild, witness for the South Carolina Department of Consumer Affairs ("DCA"),  
18   sometimes referred to herein as the "Opposing ROE Witnesses" concerning the investor  
19   required ROE of Blue Granite Water Company ("BGWC" or the "Company").

20   **Q. HAVE YOU PREPARED AN EXHIBIT IN SUPPORT OF YOUR REBUTTAL**  
21   **TESTIMONY?**

22   A. Yes. I have prepared D'Ascendis Rebuttal Exhibit No. 1, which consists of Schedules  
23   DWD-1R through DWD-12R.

1 **III. SUMMARY**

2 **Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.**

3 A. First, my updated analysis results in a recommendation that the South Carolina Public  
4 Service Commission (the “Commission” or “SC PSC”) authorize the Company the  
5 opportunity to earn a WACC between 7.86% and 8.12%, based on a ratemaking capital  
6 structure as of June 30, 2019. The ratemaking capital structure is based on the actual capital  
7 structure of BGWC’s parent, CORIX Regulated Utilities, Inc., at June 30, 2019. It consists  
8 of 47.09% long-term debt at an embedded cost rate of 5.73% and 52.91% common equity  
9 at my updated range of ROEs between 9.75% to 10.25%. My updated recommended range  
10 of overall rate of returns is summarized on page 1 of Schedule DWD-1R and in Table 1,  
11 below:

12 **Table 1: Summary of Updated Overall Rate of Return**

<u>Type of Capital</u>	<u>Ratios</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
Long-Term Debt	47.09%	5.73%	2.70%
Common Equity	<u>52.91%</u>	9.75% - 10.25%	<u>5.16% - 5.42%</u>
Total	<u>100.00%</u>		<u>7.86% - 8.12%</u>

13 Second, I will respond to Mr. Parcell’s estimation of the Company’s ROE and  
14 explain its shortcomings, including his:

- 15 • Undue weighting of his DCF results;
- 16 • Misapplication of the Capital Asset Pricing Model (“CAPM”);
- 17 • Misapplication of the Comparable Earnings Model (“CEM”); and
- 18 • Failure to account for BGWC’s size-specific risks over and above the range of
- 19 ROEs indicated by his proxy groups.

1 Third, I will respond to Mr. Rothschild's estimation of the Company's ROE and  
2 explain its shortcomings, including his:

- 3 • Opinions regarding current and expected capital markets;
- 4 • Misapplication of DCF models;
- 5 • Misapplication of the CAPM; and
- 6 • Downward adjustment to his indicated ROE for financial risk.

7 Finally, I will respond to the unfounded critiques of my direct testimony made by  
8 the Opposing ROE Witnesses.

9 **IV. UPDATED ANALYSIS**

10 **Q. PLEASE DISCUSS YOUR UPDATED ANALYSIS IN THIS PROCEEDING.**

11 A. My updated analysis as of January 17, 2020 reflects current investor expectations and is  
12 contained in Schedule DWD-1R.

13 **Q. WERE THERE ANY CHANGES TO YOUR UTILITY PROXY GROUP?**

14 A. Yes. I have included SJW Corp. in my updated analysis, as their acquisition of Connecticut  
15 Water Service Group was completed in October 2019 and they pass the rest of my selection  
16 criteria as described on pages 11 and 12 of my direct testimony.

17 **Q. HAVE YOU APPLIED THE COST OF COMMON EQUITY MODELS IN THE**  
18 **SAME MANNER AS YOU APPLIED THEM IN YOUR DIRECT TESTIMONY?**

19 A. Yes, I have.

1   **V.    RESPONSE TO MR. PARCELL**

2   **Q.    PLEASE PROVIDE A SUMMARY OF MR. PARCELL'S DIRECT TESTIMONY**  
3   **AND RECOMMENDATIONS.**

4   A.    Mr. Parcell estimates BGWC's cost of common equity based on the results of his constant  
5       growth DCF model, the CAPM, and the CEM. From these results, Mr. Parcell recommends  
6       a range of common equity cost rates of 8.90% (DCF) to 10.00% (CEM). From this range,  
7       he recommends a 9.45% common equity cost rate for BGWC.<sup>1</sup>

8   **Q.    DO YOU HAVE ANY GENERAL COMMENTS ON MR. PARCELL'S ANALYSES**  
9   **AND RECOMMENDATIONS?**

10  A.    Yes. I would note that my updated range of ROEs, 9.75% to 10.25% and Mr. Parcell's  
11       recommended range of ROEs, 8.90% to 10.00% overlap between 9.75% and 10.00%.

12  **Q.    PLEASE SUMMARIZE THE KEY AREAS WITH WHICH YOU DISAGREE**  
13  **WITH MR. PARCELL'S ANALYSES AND RECOMMENDATIONS.**

14  A.    The principal areas in Mr. Parcell's analyses with which I disagree include the significant  
15       weighting of his DCF results, his application of the CAPM, his application of the CEM,  
16       and his failure to recognize the greater operational risk BGWC faces relative to that of his  
17       proxy group companies.

18       **A.   Significant Weighting of DCF Results**

18  **Q.    DID MR. PARCELL RELY EQUALLY ON HIS DCF AND CEM ANALYSIS?**

19  A.    Yes, he did. Mr. Parcell relied equally on the results of his DCF model and CEM to form  
20       his recommended range of common equity cost rates, 8.90% and 10.00%. While I do not

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<sup>1</sup> Direct Testimony of ORS Witness Parcell at 3-4.

1 agree with his use of historical growth rates, nor his use of growth rates in dividends per  
 2 share (“DPS”) nor book value per share (“BVPS”), his DCF results are comparable to my  
 3 DCF results. Regardless of the comparability of mine and Mr. Parcell’s DCF results, all  
 4 DCF results should be viewed with caution, as the DCF model currently understates the  
 5 investor-required return.

6 **Q. WHY SHOULD DCF MODEL RESULTS BE VIEWED WITH CAUTION AT THIS**  
 7 **TIME?**

8 A. Traditional rate base / rate of return regulation, where a market-based common equity cost  
 9 rate is applied to a book value rate base, presumes that market-to-book (“M/B”) ratios are  
 10 at unity or 1.00. However, that is rarely the case. Morin states:

11 The third and perhaps most important reason for caution and skepticism is  
 12 that application of the DCF model produces estimates of common equity  
 13 cost that are consistent with investors’ expected return only when stock  
 14 price and book value are reasonably similar, that is, when the M/B is close  
 15 to unity. As shown below, application of the standard DCF model to utility  
 16 stocks understates the investor’s expected return when the market-to-book  
 17 (M/B) ratio of a given stock exceeds unity. This was particularly relevant  
 18 in the capital market environment of the 1990s and 2000s where utility  
 19 stocks were trading at M/B ratios well above unity and have been for nearly  
 20 two decades. The converse is also true, that is, the DCF model overstates  
 21 that investor’s return when the stock’s M/B ratio is less than unity. The  
 22 reason for the distortion is that the DCF market return is applied to a book  
 23 value rate base by the regulator, that is, a utility’s earnings are limited to  
 24 earnings on a book value rate base.<sup>2</sup>

25 As he explains, DCF models assume an M/B ratio of 1.0 and therefore under- or  
 26 over-states investors’ required return when market value exceeds or is less than book value,  
 27 respectively. It does so because equity investors evaluate and receive their returns on the  
 28 market value of a utility’s common equity, whereas regulators authorize returns on the

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<sup>2</sup> Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, at 434 (“Morin”).

book value of a utility's common equity. This means that the market-based DCF will produce the total annual dollar return expected by investors, only when market and book values of common equity are equal, a very rare and unlikely situation. Mr. Rothschild confirms this mathematical fact on pages 31 and 32 of his direct testimony.

**Q. WHY DO MARKET AND BOOK VALUES DIVERGE?**

A. Market values diverge from book values for a myriad of reasons including, but not limited to, earnings per share ("EPS") and DPS expectations, merger / acquisition expectations, interest rates, etc. As noted by Phillips:

Many question the assumption that market price should equal book value, believing that 'the earnings of utilities should be sufficiently high to achieve market-to-book ratios which are consistent with those prevailing for stocks of unregulated companies.'<sup>3</sup>

In addition, Bonbright states:

In the first place, commissions cannot forecast, except within wide limits, the effect their rate orders will have on the market prices of the stocks of the companies they regulate. In the second place, *whatever the initial market prices may be, they are sure to change not only with the changing prospects for earnings, but with the changing outlook of an inherently volatile stock market.* In short, market prices are beyond the control, though not beyond the influence of rate regulation. Moreover, even if a commission did possess the power of control, any attempt to exercise it ... would result in harmful, uneconomic shifts in public utility rate levels.<sup>4</sup>

**Q. CAN THE UNDER- OR OVER-STATEMENT OF INVESTORS' REQUIRED RETURN BY THE DCF MODEL BE DEMONSTRATED MATHEMATICALLY?**

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<sup>3</sup> Charles F. Phillips, The Regulation of Public Utilities, Public Utilities Reports, Inc., 1993, at 395 ("Phillips").

<sup>4</sup> James C. Bonbright, Albert L. Danielsen and David R. Kamerschen, Principles of Public Utility Rates (Public Utilities Reports, Inc., 1988), at 334 (emphasis added) ("Bonbright").



1 A. Yes. Schedule DWD-2R demonstrates how a market-based DCF cost rate of 8.90%, when  
2 applied to a book value substantially below market value, will understate investors'  
3 required return on market value. As shown, there is no realistic opportunity to earn the  
4 expected market-based rate of return on book value. For example, in Column [A], investors  
5 expect an 8.90% return on an average market price of \$65.28 for Mr. Parcell's Value Line  
6 Water Group. Column [B] shows that when Mr. Parcell's 8.90% return rate is applied to a  
7 book value of \$18.36,<sup>5</sup> the total annual return opportunity is \$1.634. After subtracting  
8 dividends of \$1.162, the investor only has the opportunity for \$0.472 in market  
9 appreciation, or 2.50%. The magnitude of the understatement of investors' required return  
10 on market value using Mr. Parcell's 8.90% cost rate is 6.40%, which is calculated by  
11 subtracting the market appreciation based on book value of 2.50% from Mr. Parcell's  
12 expected growth rate of 7.12%. Also as shown on Schedule DWD-2R, Mr. Rothschild's  
13 non-constant growth DCF model actually provides a negative return on market value,  
14 which is one of many problems present in that model, which I will go into substantial detail  
15 below.

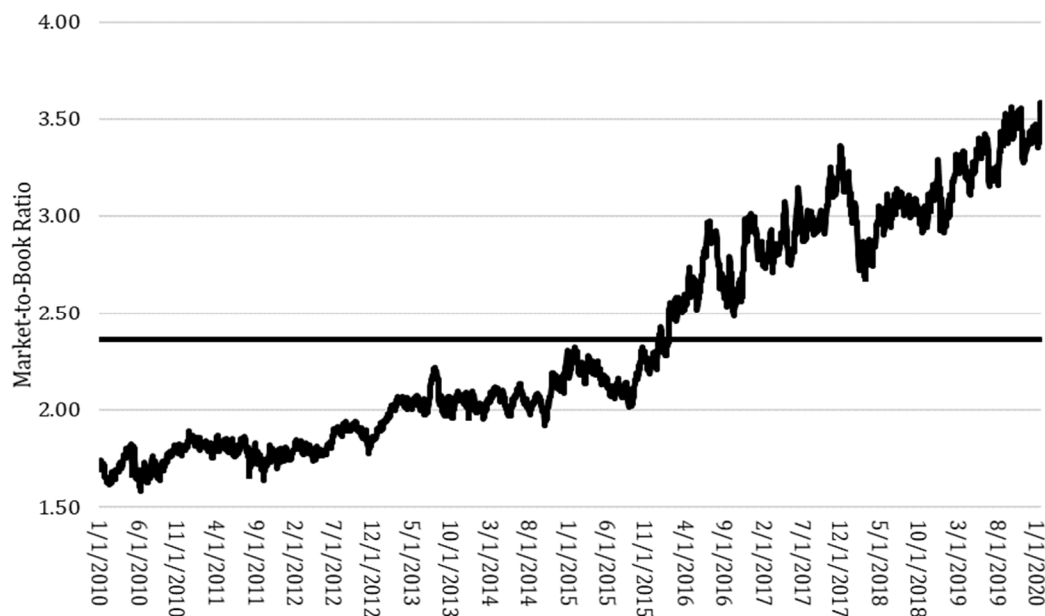
16 **Q. HOW DO M/B RATIOS OF THE COMBINED PROXY GROUP COMPARE TO**  
17 **THEIR TEN-YEAR AVERAGE?**

18 A. The average M/B ratio of the combined proxy group is currently extraordinarily high  
19 compared to the ten-year average. As shown in Chart 1, below, since early 2016, the M/B  
20 ratios of the combined proxy group have increased significantly over its ten-year average  
21 M/B ratio of approximately 2.35 times.

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<sup>5</sup> Representing a market-to-book ratio of 222.69%.

**Chart 1: M/B Ratios of the Combined Gas Utility Proxy Group Compared with Ten-Year Average<sup>6</sup>**



The significance of this is that, even though the ten-year average M/B ratio has always been different than 1.0x, the current M/B ratio is even further removed from 1.0x, further distorting DCF results.

**Q. IS THERE ANOTHER WAY TO QUANTIFY THE INACCURACY OF THE DCF MODEL WHEN M/B RATIOS ARE DIFFERENT THAN UNITY?**

A. Yes. One can quantify the inaccuracy of the DCF model when M/B ratios are not at unity by estimating the implied DCF model results (based on a market-value capital structure) to reflect a book-value capital structure. This can be measured by first calculating the market value of each proxy company's capital structure, which consists of the market value of the company's common equity (shares outstanding multiplied by price) and the fair value of

<sup>6</sup> Source: Bloomberg Financial Services.

the company's long-term debt and preferred stock. All of these measures, except for market price, are available in each company's SEC Form 10-K.

Second, one must de-leverage the implied cost of common equity based on the DCF. This is derived using the Modigliani / Miller equation<sup>7</sup> as illustrated in Schedule DWD-3R and shown below:

$$k_u = k_e - (((k_u - i)(1 - t)) D/E) - (k_u - d) P/E \text{ [Equation 1]}$$

Where:

$k_u$  = Unlevered (i.e., 100% equity) cost of common equity;  
 $k_e$  = Market determined cost of common equity;  
 $i$  = Cost of debt;  
 $t$  = Income tax rate;  
 $D$  = Debt ratio;  
 $E$  = Equity ratio;  
 $d$  = Cost of preferred stock; and  
 $P$  = Preferred equity ratio.

For example, using Mr. Parcell's average proxy group-specific data, the equation becomes:

$$k_u = 8.90\% - (((k_u - 5.18\%)(1 - 21\%)) 23.72\% / 76.24\%) - (k_u - 7.38\%) 0.03\% / 76.24\%$$

Solving for  $k_u$  results in an unlevered cost of common equity of 8.17%. Next, one must re-lever these costs of common equity by relating them to each proxy group's average book capital structure as shown below:

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<sup>7</sup> The Modigliani / Miller theorem is an influential element of economic theory and forms the basis for modern theory on capital structure. See Modigliani, F., and Miller, M. "The Cost of Capital, Corporation Finance and the Theory of Investment", The American Economic Review, Vol. 48, No. 3, (June 1958), at 261-297.

$$k_e = k_u + (((k_u - i)(1 - t)) D/E) + (k_u - d) P/E \text{ [Equation 2]}$$

Once again, using Mr. Parcell's average proxy group-specific data, the equation becomes:

$$k_e = 8.17\% + (((8.17\% - 5.18\%)(1 - 21\%))44.95\%/54.97\%) + (8.17\% - 7.38\%)0.08\%/54.97\%$$

Solving for  $k_e$  results in a 10.10% indicated cost of common equity relative to the book capital structure of the proxy group, which is an increase of 120 basis points (1.20%) over Mr. Parcell's indicated DCF result of 8.90%.<sup>8</sup> The leverage-adjusted DCF result of Mr. Parcell's Value Line Water Group are still not applicable to BGWC, as it does not reflect the higher risk that BGWC faces relative to the proxy group given its smaller size. Additionally, as stated in my direct testimony,<sup>9</sup> consideration of multiple ROE models is also necessary to gain further insight into the investor-required return, where the DCF is only one tool among many.

**Q. ARE YOU ADVOCATING A SPECIFIC ADJUSTMENT TO THE DCF RESULTS TO CORRECT FOR ITS MISSPECIFICATION OF THE INVESTOR-REQUIRED RETURN?**

**A.** No. The purpose of this discussion is to demonstrate that like all cost of common equity models, the DCF has its limitations. In addition, the use of multiple cost of common equity models, in conjunction with informed expert judgment, provides a more accurate and reliable picture of the investor-required ROE than does a narrow evaluation of the results of one model.

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<sup>8</sup> Also shown on Schedule DWD-3R, upward adjustments of 140 and 71 basis points would be indicated for Mr. Rothschild's constant growth and non-constant DCF results of 8.76% and 6.96%, respectively.

<sup>9</sup> Direct Testimony of Blue Granite Witness D'Ascendis at 35.

**B. Application of the CAPM**

**Q. DO YOU HAVE ANY GENERAL COMMENTS ON MR. PARCELL'S CAPM ANALYSIS?**

A. Yes. Mr. Parcell's indicated return on common equity using the CAPM is 6.20%, which is unreasonable on its face. Mr. Parcell also recognizes this fact and does not consider his CAPM results in the determination of his final cost of common equity range. I would argue that Mr. Parcell's use of incorrect inputs in his application of the CAPM is the driving factor for the unreasonableness of his CAPM result, and not because of any of the external factors Mr. Parcell identifies on page 37 of his direct testimony.

**Q. PLEASE EXPLAIN.**

A. On page 37 of his direct testimony, Mr. Parcell provides two reasons why his CAPM results are lower than his DCF and CEM results. First, Mr. Parcell claims that market risk premiums ("MRP") are lower than they have been in recent years, and second, that the level of interest rates on U.S. Treasury bonds (*i.e.*, the risk-free rate) has also been lower in recent years.

Turning first to the equity risk premium, data from 2019 SBBI® Yearbook | Stocks, Bonds, Bills and Inflation ("SBBI-2019") show that Mr. Parcell's contention that MRPs are lower now than historically is false. As shown on Schedule DWD-4R, for the ten years ended 2018, the MRP between large company stocks and long-term government bonds is 10.59%, significantly higher than the long-term average MRP of 6.91%, indicating higher MRPs currently than historically, which is the opposite of what is Mr. Parcell's claim.

Turning next to the current low interest rate environment, while I agree with Mr. Parcell that the level of interest rates is low compared to historical averages, I disagree with

1 Mr. Parcell's implicit assumption that the movement of interest rates changes in lockstep  
2 with CAPM results. Prior research, for example, has shown that the equity risk premium  
3 ("ERP") is inversely related to the level of interest rates, meaning that as interest rates fall,  
4 the ERP rises and vice versa.<sup>10</sup> That finding is particularly relevant given the relatively  
5 low level of current Treasury yields.

6 **Q. PLEASE COMMENT ON MR. PARCELL'S CAPM ANALYSIS.**

7 A. Mr. Parcell's CAPM analysis is flawed in at least three respects. First, he has incorrectly  
8 relied on an historical, *i.e.*, recent,<sup>11</sup> risk-free rate despite the fact that both ratemaking and  
9 the cost of capital are prospective. Second, he incorrectly calculated the MRP by relying  
10 on (1) achieved, or non-market based, rates of return on book common equity for the S&P  
11 500, a proxy for the market; (2) a geometric mean historical market equity risk premium;  
12 and (3) the historical total return on U.S. Treasury bonds. Third, Mr. Parcell did not  
13 incorporate an empirical CAPM ("ECAPM") analysis even though empirical evidence  
14 indicates that low-beta securities, such as utilities, earn returns higher than the CAPM  
15 predicts and high-beta securities earn less.

16 **Q. WHY IS MR. PARCELL'S USE OF CURRENT YIELDS (I.E., A RECENT THREE-**  
17 **MONTH AVERAGE), ON 20-YEAR U.S. TREASURY BONDS NOT**  
18 **APPROPRIATE FOR COST OF CAPITAL PURPOSES?**

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<sup>10</sup> See, for example, Robert S. Harris and Felicia C. Marston, *Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts*, Financial Management, Summer 1992, at 63-70; Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, Financial Management, Spring 1985, at 33-45; and Farris M. Maddox, Donna T. Pippert, and Rodney N. Sullivan, *An Empirical Study of Ex Ante Risk Premiums for the Electric Utility Industry*, Financial Management, Autumn 1995, at 89-95.

<sup>11</sup> Exhibit DCP-2, Schedule 8.

1 A. Mr. Parcell's use of current, not projected, yields on 20-year U.S. Treasury bonds is not  
 2 appropriate for two reasons. First, Mr. Parcell's risk-free rate ignores the fact that the cost  
 3 of capital and ratemaking are both prospective. Mr. Parcell concurs with this concept when  
 4 he states:

5 Neither the courts nor economic/financial theory has developed exact and  
 6 mechanical procedures for precisely determining the cost of capital because  
 7 the cost of capital is an opportunity cost and is prospective-looking, which  
 8 dictates that it must be estimated.<sup>12</sup>

9 In addition, Mr. Parcell implicitly agrees when he uses, in part, projected growth  
 10 rates in his DCF analysis.

11 Second, as discussed below, the tenor of the risk-free rate used in the CAPM should  
 12 match the life (or duration) of the underlying investment. As noted by Morningstar:

13 The traditional thinking regarding the time horizon of the chosen Treasury  
 14 security is that it should match the time horizon of whatever is being valued.  
 15 When valuing a business that is being treated as a going concern, the  
 16 appropriate Treasury yield should be that of a long-term Treasury bond.  
 17 Note that the horizon is a function of the investment, not the investor. If an  
 18 investor plans to hold stock in a company for only five years, the yield on a  
 19 five-year Treasury note would not be appropriate since the company will  
 20 continue to exist beyond those five years.<sup>13</sup>

21 Morin also confirms this when he states:

22 [b]ecause common stock is a long-term investment and because the cash  
 23 flows to investors in the form of dividends last indefinitely, the yield on  
 24 very long-term government bonds, namely, the yield on 30-year Treasury  
 25 bonds, is the best measure of the risk-free rate for use in the CAPM <sup>(footnote</sup>  
 26 omitted) ... The expected common stock return is based on long-term cash  
 27 flows, regardless of an individual's holding time period.<sup>14</sup>

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<sup>12</sup> Direct Testimony of ORS Witness Parcell at 9.

<sup>13</sup> Morningstar, Inc., 2013 Ibbotson Stocks, Bonds, Bills and Inflation Valuation Yearbook, at 44.

<sup>14</sup> Morin, at 151.

1 Pratt and Grabowski recommend a similar approach to selecting the risk-free rate:  
 2 “In theory, when determining the risk-free rate and the matching ERP you should be  
 3 matching the risk-free security and the ERP with the period in which the investment cash  
 4 flows are expected.”<sup>15</sup> To that point, a 2004 paper titled *Applying The Capital Asset*  
 5 *Pricing Model* by Robert Harris reviews current practices for application of the CAPM  
 6 and, when summarizing best current practices, concludes “[t]he risk-free rate should match  
 7 the tenor of the cash flows being valued.”<sup>16</sup> As a practical matter, equity securities  
 8 represent a perpetual claim on cash flows; 30-year Treasury bonds are the longest-maturity  
 9 securities available to approximate that perpetual claim. Given the requested composite  
 10 depreciation rate of 3.69%,<sup>17</sup> this equates to an approximate useful life of 27 years. Mr.  
 11 Parcell’s use of a 20-year Treasury bond yield does not match the life of the assets being  
 12 valued. The use of a 30-year Treasury bond is a more appropriate risk-free rate.

13 In view of the above, the appropriate risk-free rate available at the time of the  
 14 preparation of Mr. Parcell’s direct testimony is the average of the consensus forecasts of  
 15 approximately 50 economists from *Blue Chip Financial Forecasts* (“Blue Chip”) for the  
 16 six quarters ending with the second quarter 2021, from the January 1, 2020 edition, and the  
 17 long-range consensus forecasts from the December 1, 2019, edition for 2021-2025 and  
 18 2026-2030, or 2.70%, as derived in note 2 on page 24 of Schedule DWD-1R.<sup>18</sup>

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<sup>15</sup> Shannon Pratt and Roger Grabowski, Cost of Capital: Applications and Examples, 3rd Ed. (Hoboken, NJ: John Wiley & Sons, Inc., 2008), at 92. “ERP” is the Equity Risk Premium.

<sup>16</sup> Paper cited with permission of the author.

<sup>17</sup> Average of requested depreciation rates for water (4.06%) and wastewater (3.32%).

<sup>18</sup> Both documents would have been available when Mr. Parcell conducted his rate of return in early January 2020.



1 **Q. DO YOU AGREE WITH MR. PARCELL'S ESTIMATION OF THE MRP FOR HIS**  
2 **CAPM ANALYSIS?**

3 A. No, I do not. Mr. Parcell's derivation of the market equity risk premium has three flaws.  
4 First, he incorrectly relied on achieved rates of return on book common equity for the S&P  
5 500. Second, he incorrectly relied, in part, on geometric mean historical market returns.  
6 Third, he incorrectly relied on the historical mean total return on U.S. Treasury securities.

7 **Q. PLEASE COMMENT ON MR. PARCELL'S ESTIMATION OF THE MRP USING**  
8 **THE RATE OF RETURN ON BOOK COMMON EQUITY FOR THE S&P 500.**

9 A. Mr. Parcell's derivation of the market equity risk premium using the rate of return on book  
10 common equity for his CAPM analysis is flawed. Mr. Parcell used the achieved rates of  
11 earnings on book common equity of the S&P 500 Composite for the period 1978-2018 as  
12 shown on Exhibit DCP-2 Schedule 7. The underlying theory of the CAPM requires the  
13 use of an expected market return with which Mr. Parcell implicitly concurs, as noted  
14 previously.<sup>19</sup> Therefore, the use of historically achieved earnings on book common equity  
15 is inconsistent with both the prospective nature of the cost of capital and ratemaking, as  
16 well as with the very theory of the CAPM.

17 Notwithstanding the bias and instability which can be introduced when short term  
18 MRPs are estimated, and the fact that Mr. Parcell's S&P MRP is not based on market data,  
19 the data shown on Exhibit DCP-2, Schedule 7 can be used to estimate a market equity risk  
20 premium which reflects the well-established inverse relationship between market equity  
21 risk premiums and interest rates. As demonstrated on page 3 of Schedule DWD-5R, the

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<sup>19</sup> Direct Testimony of ORS Witness Parcell at 9.

1 data contained in Mr. Parcell's Exhibit DCP-2, Schedule 7 produce a statistically  
2 significant negative relationship between the market equity risk premium and the 20-year  
3 U.S. Treasury bond yield. Consequently, if Mr. Parcell chooses to use the projected 30-  
4 year U.S. Treasury bond yield, which is significantly below the 6.48% average over that  
5 time, he should recognize that the market equity risk premium would be considerably  
6 higher than 7.26%.<sup>20</sup> In fact, when the inverse relationship between market equity risk  
7 premium and interest rates via a simple linear regression analysis is derived, a market  
8 equity risk premium of 10.88% is indicated.<sup>21</sup>

9 **Q. PLEASE COMMENT ON MR. PARCELL'S USE OF THE GEOMETRIC MEAN**  
10 **HISTORICAL MARKET RETURN.**

11 A. On page 29 of his direct testimony, Mr. Parcell notes that he has relied on both the  
12 arithmetic and geometric mean returns for the S&P 500 as tabulated by Morningstar  
13 (Ibbotson Associates). However, only arithmetic mean return rates, equity risk premiums,  
14 and yields are appropriate for cost of capital purposes because ex-post (historical) total  
15 returns and equity risk premiums differ in size and direction over time. The arithmetic  
16 mean captures the prospect for variance in returns and equity risk premiums, providing the  
17 valuable insight needed by investors in estimating risk in the *future* when making a *current*  
18 investment. Absent such valuable insight into the potential variance of returns, investors  
19 cannot meaningfully evaluate prospective risk. The geometric mean of ex-post equity risk  
20 premiums provides no insight into the potential variance of future returns, because the

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<sup>20</sup> *Ibid.*, at Exhibit DCP-2, Schedule 7.

<sup>21</sup> Schedule DWD-5R, page 3.

geometric mean relates the change over many periods to a constant rate of change, rather than the year-to-year fluctuations, or variance, *critical to risk analysis*. Therefore, the geometric mean is of little to no value to investors seeking to measure risk. Moreover, from a statistical perspective, since stock returns and equity risk premiums are randomly generated, the arithmetic mean is expectational and consistent with the prospective nature of the cost of capital and ratemaking noted above.

The financial literature is quite clear that risk is measured by the variability of expected returns, *i.e.*, the probability distribution of returns.<sup>22</sup> SBBI-2019<sup>23</sup> explains in detail why the arithmetic mean is the correct mean to use when estimating the cost of capital.

In addition, Weston and Brigham provide the standard financial textbook definition of the riskiness of an asset when they state:

The riskiness of an asset is defined in terms of the *likely variability of future returns from the asset*.<sup>24</sup>

Furthermore, Morin states:

The geometric mean answers the question of *what constant return* you would have to achieve in each year to have your investment growth match the return achieved by the stock market. The arithmetic mean answers the question of what growth rate is the best estimate of the *future* amount of money that will be produced by continually reinvesting in the stock market. It is the rate of return which, compounded over multiple periods, gives the mean of the probability distribution of ending wealth.<sup>25</sup>

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<sup>22</sup> Eugene F. Brigham, Fundamentals of Financial Management, (The Dryden Press, 1989), at 639.

<sup>23</sup> SBBI-2019, at p. 10-22.

<sup>24</sup> J. Fred Weston and Eugene F. Brigham, Essentials of Managerial Finance, 3rd Edition (The Dryden Press, 1974), at 272 (emphasis added).

<sup>25</sup> Morin, at 133 (emphasis added).

1 In addition, Brealey and Myers note:

2 The proper uses of arithmetic and compound rates of return from past  
 3 investments are often misunderstood... Thus the arithmetic average of the  
 4 returns correctly measures the opportunity cost of capital for investments...  
 5 *Moral:* If the cost of capital is estimated from historical returns or risk  
 6 premiums, use arithmetic averages, not compound annual rates of return.  
 7 (italics in original)<sup>26</sup>

8 As previously discussed, investors gain insight into relative risk by analyzing  
 9 expected *future* variability. This is accomplished through the use of the arithmetic mean  
 10 of a random distribution of returns / premiums. Only the arithmetic mean takes into  
 11 account all of the returns / premiums, hence providing meaningful insight into the variance  
 12 and standard deviation of those returns / premiums.

13 **Q. CAN IT BE DEMONSTRATED THAT THE ARITHMETIC MEAN TAKES INTO**  
 14 **ACCOUNT ALL OF THE RETURNS AND, THEREFORE, THE ONLY**  
 15 **APPROPRIATE MEAN TO USE WHEN ESTIMATING THE COST OF**  
 16 **CAPITAL?**

17 A. Yes, pages 1 and 2 of Schedule DWD-6R graphically demonstrate this. Page 1 charts the  
 18 SBBI-2019 returns on large company stocks for each and every year from 1926 through  
 19 2018. It is clear from looking at the year-to-year variation of these returns that stock market  
 20 returns and, hence, equity risk premiums vary.

21 The distribution of each of those returns for the period from 1926 through 2018 is  
 22 shown on page 2. There is a clear bell-shaped pattern to the probability distribution of  
 23 returns, an indication that they are randomly generated and not serially correlated. The

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<sup>26</sup> Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance, 5<sup>th</sup> Ed. (McGraw-Hill Publications, Inc., 1996), at 146-147 (“Brealey and Myers”).

1 arithmetic mean of this distribution of returns considers each and every return in the  
2 distribution. In doing so, the arithmetic mean takes into account the standard deviation or  
3 likely variance which may be experienced in the future when estimating the rate of return  
4 based on such historical returns.

5 In contrast, the geometric mean considers only two of the returns, the initial and  
6 terminal years, which, in this case, are 1926 and 2018. Based on only those two years, a  
7 constant rate of return is calculated by the geometric average. That constant return is  
8 graphically represented by a flat line, showing no year-to-year variation, for the entire 1926  
9 to 2018 time period. This is obviously unrealistic, based on the histogram, or probability  
10 distribution of returns shown on page 2, and demonstrated on page 1 of Schedule DWD-  
11 6R. In view of the foregoing, Mr. Parcell should have exclusively relied on the long-term  
12 arithmetic average return on the market in calculating his historical risk premium using  
13 SBBI-2019 data.

14 **Q. PLEASE COMMENT ON MR. PARCELL'S USE OF THE HISTORICAL MEAN**  
15 **TOTAL RETURN ON U.S. TREASURY SECURITIES.**

16 A. Although relying on Morningstar's (Ibbotson Associates) historical returns in his CAPM  
17 analysis, Mr. Parcell has ignored Ibbotson Associates' recommendation regarding the use  
18 of the income return and not the total return on U.S. Treasury securities in deriving an  
19 equity risk premium. As indicated in SBBI-2019,

20 Another point to keep in mind when calculating the equity risk premium is  
21 that the income return on the appropriate-horizon Treasury security, rather  
22 than the total return, is used in the calculation.

23  
24 The total return is comprised of three return components: the income return,  
25 the capital appreciation return, and the reinvestment return. The income  
26 return is defined as the portion of the total return that results from a periodic

1 cash flow or, in this case, the bond coupon payment. The capital  
 2 appreciation return results from the price change of a bond over a specific  
 3 period. Bond prices generally change in reaction to unexpected fluctuations  
 4 in yields. Reinvestment return is the return on a given month's investment  
 5 income when reinvested into the same asset class in the subsequent months  
 6 of the year. The income return is thus used in the estimation of the equity  
 7 risk premium because it represents the truly riskless portion of the return.<sup>27</sup>

8 Also, as shown in SBBI-2019 on page 6-17, the standard deviation for the income  
 9 return on long-term Government bonds is 2.6%, which is the lowest (*i.e.*, least risky)  
 10 measure of all bond returns followed by SBBI. Mr. Parcell's recommended measure of the  
 11 risk-free rate, the total return on long-term Government bonds, has a standard deviation of  
 12 9.8%, which is the highest (*i.e.*, most risky) measure of all bond returns followed by SBBI.  
 13 These measures alone warrant the use of the income return on long-term government bonds  
 14 as the appropriate proxy of the risk-free rate for use in the calculation of the MRP in a  
 15 CAPM analysis.

16 In view of the above, the correct derivation of the historical market equity risk  
 17 premium is the difference between the arithmetic mean total return on large company  
 18 common stocks of 11.9% and the arithmetic mean 1926-2018 income return on long-term  
 19 government bonds of 5.0%, which results in a market equity risk premium of 6.9%.<sup>28</sup>

20 **Q. DOES MR. PARCELL PERFORM AN ECAPM IN HIS CAPM ANALYSES?**

21 A. No. Mr. Parcell failed to consider the ECAPM, despite the fact that numerous tests of the  
 22 CAPM have confirmed the ECAPM's validity by showing that the empirical Security  
 23 Market Line ("SML") described by the traditional CAPM is not as steeply sloped as the

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<sup>27</sup> SBBI-2019, at p. 10-22.

<sup>28</sup> SBBI-2019, at 6-17.

1 predicted SML. While the results of these tests support the notion that beta is related to  
 2 security returns, the empirical SML described by the CAPM formula is not as steeply  
 3 sloped as the predicted SML<sup>29</sup> as discussed in pages 27 through 29 of my direct testimony.

4 **Q. DOES THE USE OF ADJUSTED BETAS ADDRESS THE EMPIRICAL ISSUES**  
 5 **WITH THE CAPM?**

6 A. No. A common critique of the ECAPM is the claim that using adjusted betas in a CAPM  
 7 analysis addresses the empirical issues with the CAPM, discussed above, by increasing the  
 8 expected returns for low beta stocks and decreasing the returns for high beta stocks,  
 9 concluding that there is no need to use the ECAPM. This is an incorrect understanding of  
 10 the ECAPM. Using adjusted betas in a CAPM analysis is not equivalent to using the  
 11 ECAPM, nor is it an unnecessary redundancy.

12 Betas are adjusted because of their general regression tendency to converge toward  
 13 1.0 over time, *i.e.*, over successive calculations of beta. As also noted above, numerous  
 14 studies have determined that the SML described by the CAPM formula at any given  
 15 moment in time is not as steeply sloped as the predicted SML. Morin states:

16 Some have argued that the use of the ECAPM is inconsistent with the use  
 17 of adjusted betas, such as those supplied by Value Line and Bloomberg.  
 18 This is because the reason for using the ECAPM is to allow for the tendency  
 19 of betas to regress toward the mean value of 1.00 over time, and, since Value  
 20 Line betas are already adjusted for such trend [sic], an ECAPM analysis  
 21 results in double-counting. This argument is erroneous. Fundamentally,  
 22 the ECAPM is not an adjustment, increase or decrease, in beta. This is  
 23 obvious from the fact that the expected return on high beta securities is  
 24 actually lower than that produced by the CAPM estimate. The ECAPM is  
 25 a formal recognition that the observed risk-return tradeoff is flatter than  
 26 predicted by the CAPM based on myriad empirical evidence. The ECAPM  
 27 and the use of adjusted betas comprised two separate features of asset  
 28 pricing. Even if a company's beta is estimated accurately, the CAPM still

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<sup>29</sup> Morin, at 175.

understates the return for low-beta stocks. Even if the ECAPM is used, the return for low-beta securities is understated if the betas are understated. Referring back to Figure 6-1, the ECAPM is a return (vertical axis) adjustment and not a beta (horizontal axis) adjustment. Both adjustments are necessary.<sup>30</sup>

Moreover, the slope of the SML should not be confused with beta. As Brigham and Gapenski state:

The slope of the SML reflects the degree of risk aversion in the economy – the greater the average investor's aversion to risk, then (1) the steeper is the slope of the line, (2) the greater is the risk premium for any risky asset, and (3) the higher is the required rate of return on risky assets.<sup>12</sup>

<sup>12</sup>Students sometimes confuse beta with the slope of the SML. This is a mistake. As we saw earlier in connection with Figure 6-8, and as is developed further in Appendix 6A, beta does represent the slope of a line, but *not* the Security Market Line. This confusion arises partly because the SML equation is generally written, in this book and throughout the finance literature, as  $k_i = R_F + b_i(k_M - R_F)$ , and in this form  $b_i$  looks like the slope coefficient and  $(k_M - R_F)$  the variable. It would perhaps be less confusing if the second term were written  $(k_M - R_F)b_i$ , but this is not generally done.<sup>31</sup>

In addition, in Appendix 6A of Brigham and Gapenski's textbook entitled "Calculating Beta Coefficients," the authors demonstrate that beta, which accounts for regression bias, is not a return adjustment but rather is based on the slope of a different line.

Hence, using adjusted betas does not address the previously discussed empirical issues with the CAPM. In view of the foregoing, using adjusted betas in both the traditional and empirical applications of the CAPM is neither incorrect nor inconsistent with the financial literature, and is not an unnecessary redundancy. In view of financial theory and

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<sup>30</sup> Morin, at 191.

<sup>31</sup> Eugene F. Brigham and Louis C. Gapenski, Financial Management – Theory and Practice, 4<sup>th</sup> Ed. (The Dryden Press, 1985), at 201-204.



1 practical research, it is therefore appropriate to include the ECAPM when estimating the  
2 cost of common equity.

3 **Q. WHAT WOULD THE RESULTS OF MR. PARCELL'S CAPM ANALYSIS BE IF**  
4 **CORRECTED TO USE A PROJECTED 30-YEAR TREASURY BOND, AN**  
5 **APPROPRIATE MRP, AND EMPLOY THE ECAPM AS DISCUSSED ABOVE?**

6 A. Schedule DWD-5R presents the results of the correct applications of both the traditional  
7 CAPM and the ECAPM for Mr. Parcell's proxy groups.<sup>32</sup> Page 1 shows the average and  
8 median traditional CAPM results from 9.0% to 9.5%, and average and median ECAPM  
9 results from 9.9% to 10.3% for Mr. Parcell's proxy groups. Averaging the CAPM and  
10 ECAPM results for the groups result in a range of indicated ROEs between 9.5% and 9.9%.  
11 However, these cost rates are still understated because they do not reflect any additional  
12 risk of BGWC due to its smaller relative size. Clearly, then, Mr. Parcell's indicated CAPM  
13 result of 6.20% is grossly understated.

C. **Application of the CEM**

14 **Q. PLEASE COMMENT ON MR. PARCELL'S APPLICATION OF THE CEM.**

15 A. On pages 31 through 36 of his direct testimony, Mr. Parcell discusses his CEM result of  
16 9.0% to 10.0%. As support for his conclusion, he cites recent returns of 8.9% to 9.7% and  
17 market-to-book ratios in excess of 200%, as well as prospective returns of 9.6% to 14.0%,  
18 coupled with market-to-book ratios in excess of 300%.

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<sup>32</sup> In addition to the corrected historical MRP and the MRP generated by the regression analysis of the S&P 500 earned return results, I also included the MRP generated by the regression analysis of the SBBI-2019 data, the Value Line appreciation potential, and the MRP using the DCF analysis of the S&P 500 using Value Line data in the correction of Mr. Parcell's MRP calculation in his CAPM analysis.

1 Mr. Parcell concludes at page 36, that “[a]s a result, it is apparent that returns below  
2 this level would continue to result in M/B ratios of well above 100 percent. As I indicated  
3 earlier, the fact that M/Bs substantially exceed 100 percent indicates that historic and  
4 prospective ROEs of over 9.5 percent reflect earnings levels that are well above the actual  
5 cost of equity for those regulated companies.”<sup>33</sup> By these statements, it is clear that Mr.  
6 Parcell believes that a direct relationship exists between market-to-book ratios and the rate  
7 of earnings on book common equity. However, such a relationship is not supported by  
8 either the academic literature or by an historical analysis of the experience of unregulated  
9 companies.

10 **Q. WHAT DOES THE ACADEMIC LITERATURE SAY ABOUT THE**  
11 **RELATIONSHIP BETWEEN ALLOWED RATES OF RETURN ON COMMON**  
12 **EQUITY AND UTILITY M/B RATIOS?**

13 A. As discussed previously in this rebuttal testimony, it is very clear from the academic  
14 literature on utility regulation by Bonbright, et al.,<sup>34</sup> that there is no such direct relationship.

15 **Q. HAVE YOU PERFORMED AN ANALYSIS TO DETERMINE THE EXISTENCE**  
16 **OF A DIRECT RELATIONSHIP BETWEEN THE M/B RATIOS OF**  
17 **UNREGULATED COMPANIES AND THEIR EARNED RATE OF RETURN ON**  
18 **BOOK COMMON EQUITY?**

19 A. Yes. Because regulation acts as a surrogate for competition, it is reasonable to look to the  
20 competitive environment for evidence of a direct relationship between M/B ratios and

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<sup>33</sup> Direct Testimony of ORS Witness Parcell at 36.

<sup>34</sup> Bonbright, at 334.

1 earned ROE. To determine if Mr. Parcell's implicit assumption of such a direct  
2 relationship has any merit, I observed the M/B ratios and the earned ROEs of the S&P  
3 Industrial Index and the S&P 500 Composite Index over a long period of time. On  
4 Schedule DWD-7R, I have shown the market-to-book ratios, rates of return on book  
5 common equity (earnings/book ratios, *i.e.*, ROEs), annual inflation rates, and the earnings  
6 / book ratios net of inflation (real rate of earnings) annually for the years 1947 through  
7 2018. In each and every year, the market-to-book ratios of the S&P Industrial Index  
8 equaled or exceeded 1.00 time. In 1949, the only year in which the market-to-book ratio  
9 was 1.00 (or 100%), the real rate of earnings on book equity, adjusted for deflation, was  
10 18.1% (16.3% + 1.8%). In contrast, in 1961, when the S&P Industrial Index experienced  
11 a market-to-book ratio of 2.01 times, the real rate of earnings on book equity for the Index  
12 was only 9.1% (9.8% - 0.7%). In 1997, the market-to-book ratio for the Index was 5.88  
13 times, while the average real rate of earnings on book equity was 22.9% (24.6% - 1.7%).  
14 Clearly, there is not a relationship between earned returns on book common equity for  
15 either the market as a whole or for regulated public utilities.

16 Because this lack of a relationship between earnings / book ratios and M/B ratios  
17 covers a 72-year period, 1947 through 2018, it cannot be validly argued that, going  
18 forward, such a relationship should be expected. The analysis shown on Schedule DWD-  
19 7R, coupled with the supportive academic literature, demonstrates that while regulation is  
20 a substitute for marketplace competition, it can influence, but not directly control, market  
21 prices, and hence, M/B ratios. Thus, both theoretically and empirically, and contrary to Mr.  
22 Parcell's assumption, the rates of return investors expect to achieve, and which influence

1 their willingness to pay market prices well in excess of book values, have no direct and  
2 exclusive relationship to rates of earnings on book equity.

3 **Q. PLEASE COMMENT ON THE PROXY GROUPS MR. PARCELL USED IN HIS**  
4 **CEM ANALYSIS.**

5 A. Parcell used his utility proxy groups as well as the S&P 500 index as discussed on pages  
6 34-35 of his direct testimony in his analysis. I do not agree with these proxy groups in the  
7 context of a CEM analysis. Any proxy group selected for a CEM analysis should be broad-  
8 based in order to obviate any company-specific aberrations and should exclude utilities to  
9 avoid circularity since the achieved returns on book common equity of utilities, which is a  
10 function of the regulatory process, are influenced by regulatory awards. Hence, Mr.  
11 Parcell's CEM analysis of his utility proxy groups should be rejected.

12 That leaves his use of the S&P 500 which, in my opinion, is too broad-based to be  
13 comparable in total risk to his proxy utilities, and hence, the Company. Also, the use of  
14 the S&P 500 does not meet the “‘corresponding risk’ concept discussed in the *Bluefield*  
15 and *Hope* cases.”<sup>35</sup>

16 Because neither of Mr. Parcell's utility proxy groups nor the S&P 500 are  
17 appropriate for a CEM analysis, his entire CEM analysis should be rejected and replaced  
18 with the results of market models applied to non-price regulated proxy groups similar in  
19 total risk to his utility proxy groups.

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<sup>35</sup> Direct Testimony of ORS Witness Parcell at 32.

1 **Q. PLEASE EXPLAIN THE REASON FOR USING A NON-PRICE REGULATED**  
2 **PROXY GROUP IN A CEM ANALYSIS.**

3 A. A non-price regulated proxy group should be used in a CEM analysis as neither the *Hope*  
4 nor *Bluefield* cases specify that comparable risk companies must be regulated utilities.  
5 Since rate regulation is a substitute for the competition of the marketplace, non-price  
6 regulated firms operating in the competitive marketplace are an excellent proxy if a group  
7 can be selected to be comparable in total risk to the proxy group on whose market data one  
8 relies to estimate the cost of common equity. Theoretically and empirically-sound bases  
9 of selection result in non-regulated proxy groups comparable in total risk to Mr. Parcell's  
10 utility proxy groups.<sup>36</sup>

11 **Q. ON PAGE 44 OF HIS DIRECT TESTIMONY, MR. PARCELL SAYS IT IS**  
12 **IMPROPER TO USE NON-REGULATED FIRMS IN AN ROE ANALYSIS FOR A**  
13 **UTILITY COMPANY BECAUSE "UNREGULATED ENTERPRISES FACE**  
14 **DIFFERENT RISK AND OPERATIONAL CHARACTERISTICS. PLEASE**  
15 **RESPOND.**

16 A. As a part of his CEM analysis, Mr. Parcell considers the S&P 500 companies as a part of  
17 his analysis, so it is curious why his use of unregulated companies should be accepted and  
18 mine should be rejected. Also, this Commission has readily accepted non-regulated proxy  
19 group results from both ORS and Company witnesses for at least since 2008, most recently  
20 in BGWC's last rate case (Docket No. 2017-292-WS).

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<sup>36</sup> Frank J. Hanley & Pauline M. Ahern, "Comparable Earnings: New Life for an Old Precept," American Gas Association, *Financial Quarterly Review*, Summer 1994, at 4 – 8.

1           Nevertheless, in order to provide more information to show similarity between the  
2           Utility and Non-Price Regulated Proxy Groups, I have analyzed the coefficients of  
3           variation ("CoV")<sup>37</sup> of net profit for each group and the results of that study are shown on  
4           Schedule DWD-8R. As shown, the mean and median CoV of net profit for the Non-Price  
5           Regulated Proxy Group are within the range of CoVs of net profit set by the Utility Proxy  
6           Group companies. With this additional information, I would hope that the Commission  
7           will continue to consider non-price regulated proxy groups in this proceeding.

8   **Q.   PLEASE EXPLAIN HOW YOU CHOSE THE NON-PRICE REGULATED PROXY**  
9   **GROUPS APPLICABLE TO MR. PARCELL'S PROXY GROUPS.**

10   A.   The first step in determining a comparable earnings-based opportunity cost of common  
11          equity is to choose an appropriate broad-based group of domestic, non-price regulated  
12          firms comparable in total risk to the proxy group, but which excludes utilities to avoid  
13          circularity.

14               The selection criteria for the non-price regulated firms are based on statistics  
15          derived from Value Line's regression analyses of weekly market prices over the most  
16          recent 260 weeks, *i.e.*, five years, from the market prices paid by investors. Using a Value  
17          Line proprietary database dated December 2019, the application of the selection criteria  
18          mentioned previously<sup>38</sup> results in non-price regulated proxy groups comparable in total risk  
19          to Mr. Parcell's proxy groups. The basis of selection and the comparison groups' regression  
20          statistics are shown on Schedule DWD-9R.

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<sup>37</sup> The coefficient of variation is used by investors and economists as a measure of volatility.

<sup>38</sup> Direct Testimony of Blue Granite Witness D'Ascendis at 32-33.

1 **Q. HOW DID YOU CALCULATE THE COMMON EQUITY COST RATES FOR THE**  
2 **NON-PRICE REGULATED PROXY GROUPS THAT ARE COMPARABLE IN**  
3 **TOTAL RISK TO MR. PARCELL'S UTILITY PROXY GROUPS?**

4 A. I applied the DCF in a manner identical to Mr. Parcell's application of the DCF. I also  
5 applied the CAPM in a manner identical to my correction of Mr. Parcell's CAPM analysis  
6 for his utility proxy groups shown on Schedule DWD-5R.

7 Page 2 of Schedule DWD-10R contains the derivation of the DCF cost rates. Using  
8 the composite mean and median DCF indicated common equity cost rates based on  
9 projected earnings per share growth, cost rates between 10.1% and 10.8% are indicated for  
10 the non-price regulated proxy groups.

11 Page 3 of Schedule DWD-10R contains the CAPM applied to the non-price  
12 regulated proxy groups. The average of the traditional CAPM and ECAPM results between  
13 10.6% and 10.7% are indicated for the non-price regulated proxy groups.

14 **Q. WHAT IS YOUR CONCLUSION OF THE COMMON EQUITY COST RATE**  
15 **BASED ON THE NON-PRICE REGULATED PROXY GROUP COMPARABLE**  
16 **TO MR. PARCELL'S PROXY GROUPS?**

17 A. The indicated common equity cost rates for the non-price regulated proxy groups are  
18 between 10.4% and 11.3%, as shown on page 1 of Schedule DWD-10R and are the average  
19 of the DCF and CAPM applied to the non-price regulated groups. However, these cost  
20 rates are still understated because they do not reflect any additional risk to the Company  
21 due to its smaller relative size as will be discussed below.

**Q. WHAT WOULD MR. PARCELL'S CONCLUSION OF COMMON EQUITY COST RATE BE BASED ON THE CORRECTIONS TO HIS CAPM AND CEM ANALYSES DISCUSSED ABOVE?**

A. Based on corrections to Mr. Parcell's CAPM and CEM analyses, the analysis produces the following:

**Table 2: Corrected Parcell Results**

<b>Cost of Equity Model</b>	<b>Parcell Proxy Group</b>
Discounted Cash Flow	8.9%
Capital Asset Pricing Model	9.5% - 9.9%
Comparable Earnings	10.4% - 11.3%
Range	8.9% - 11.3%

Based on these results, ranges of common equity cost rates between 8.9% and 11.3%, are indicated with a midpoint of 10.10%. Yet, these results still understate BGWC's cost of common equity because they do not reflect BGWC's smaller size relative to Mr. Parcell's proxy groups.

**D. Adjustments to the Indicated Common Equity Cost Rate**

**Q. DOES MR. PARCELL MAKE A SPECIFIC ADJUSTMENT TO REFLECT BGWC'S INCREASED RISK RELATIVE TO THE PROXY GROUP BECAUSE OF ITS SMALLER SIZE?**

A. No, he does not. As discussed in my direct testimony,<sup>39</sup> relative company size is a significant element of business risk for which investors expect to be compensated through greater returns. Mr. Parcell does, however, select the high ends of his ranges of DCF and

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<sup>39</sup> Direct Testimony of Blue Granite Witness D'Ascendis at 38-40.



CEM cost rates to reflect “perceived unique attributes of BGWC.”<sup>40</sup> While I am heartened by Mr. Parcell’s consideration of the high end of his results based on his proxy groups, any premium reflecting the unique attributes of BGWC relative to his proxy groups should be added to the indicated results generated by those proxy groups. The reason being, if BGWC’s risk is unique relative to the proxy groups, that risk would not be reflected in the proxy groups’ market data, and therefore, indicated ROE.

**Q. PLEASE COMPARE THE SIZE OF BGWC WITH THE AVERAGE PROXY COMPANY IN MR. PARCELL’S UTILITY PROXY GROUPS.**

A. As shown below, BGWC is significantly smaller than the average company in any of Mr. Parcell’s proxy groups based on market capitalization.

**Table 3: Size as Measured by Market Capitalization for BGWC and Mr. Parcell’s Utility Proxy Groups**

	<u>Market Capitalization*</u> (\$ Millions)	<u>Times Greater than the Company</u>
BGWC		
Based on Parcell VL Proxy Group	\$64.016	
Based on Parcell Proxy Group	\$73.270	
Based on Parcell DWD Proxy Group	\$67.348	
Parcell VL Proxy Group	\$5,027.717	78.5x
Parcell Proxy Group	\$5,899.902	80.5x
Parcell DWD Proxy Group	\$4,973.951	73.9x

\*From page 1 of Schedule DWD-11R.

The Company’s estimated market capitalizations, shown in Table 3, above, and on page 1 of Schedule DWD-11R, were derived by multiplying the assumed book value of

<sup>40</sup> Direct Testimony of ORS Witness Parcell at 4, 25.

1 BGWC by the average market-to-book ratios of Mr. Parcell's proxy groups at December  
 2 31, 2019. This calculation results in indicated market capitalizations of \$64, \$73 and \$67  
 3 million, respectively for BGWC. In contrast, the market capitalization of the average  
 4 utility company in each of Mr. Parcell's proxy groups were \$5.0, \$5.9 and \$5.0 billion,  
 5 respectively.

6 Because of BGWC's smaller estimated market capitalization relative to the  
 7 estimated average market capitalization of each proxy group, a small size risk premium of  
 8 4.37% is indicated based on the Ibbotson size study referenced in my direct testimony at  
 9 page 39. This reflects the difference between the size premium applicable to the 10<sup>th</sup> decile  
 10 in which BGWC falls, and the 4<sup>th</sup> decile in which the proxy groups fall.

11 **Q. DID YOU COMPARE MR. PARCELL'S PROXY GROUPS TO BGWC USING**  
 12 **THE DUFF & PHELPS SIZE STUDY AS WELL?**

13 A. Yes. Duff & Phelps' ("D&P") 2019 Valuation Handbook Guide to Cost of Capital –  
 14 Market Results through 2018 ("D&P-2019") presents a Size Study based on the  
 15 relationship of various measures of size and return. Relative to the relationship between  
 16 average annual return and the various measures of size, D&P state:

17 **The size of a company is one of the most important risk elements to**  
 18 **consider when developing cost of equity estimates for use in valuing a**  
 19 **firm. Traditionally, researchers have used market value of equity (*i.e.*,**  
 20 **"market capitalization" or "market cap") as a measure of size in conducting**  
 21 **historical rate of return research. For example, the Center for Research in**  
 22 **Security Prices (CRSP) "deciles" are developed by sorting U.S. companies**  
 23 **by market capitalization. Another example is the Fama-French "Small**  
 24 **Minus Big" (SMB) series, which is the difference in return of "small" stocks**  
 25 **minus "big" (*i.e.*, large) stocks, as defined by market capitalization.<sup>41</sup>**

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<sup>41</sup> D&P-2018, at p. 10-1 (emphasis added).

The Size Study uses the following eight measures of size, all of which have empirically shown that over the long-term, the smaller the company, the higher the risk:

- Market Value of Common Equity (or total capital if no debt / equity);
- Book Value of Common Equity;
- Net Income (five-year average);
- Market Value of Invested Capital;
- Total Assets (Invested Capital);
- Earnings Before Interest, Taxes, Depreciation & Amortization (“EBITDA”) (five-year average);
- Sales / Operating Revenues; and
- Number of Employees.

I used the D&P Size Study to determine the approximate magnitude of any necessary risk premium due to the size of BGWC relative to Mr. Parcell’s proxy groups. Page 3 of Schedule DWD-11R shows the relative size of BGWC compared with the proxy groups.<sup>42</sup> Indicated size adjustments based on these relative measures range from 1.08% to 3.55%, averaging 1.99%. From these results, it is clear that BGWC is riskier than the utility proxy groups due to its smaller relative size, and that my proposed size adjustment of 50 basis points for BGWC is reasonable and conservative.

**Q. HAVE YOU PERFORMED AN ADDITIONAL STUDY FOR UTILITY COMPANIES THAT LINK SIZE AND RISK?**

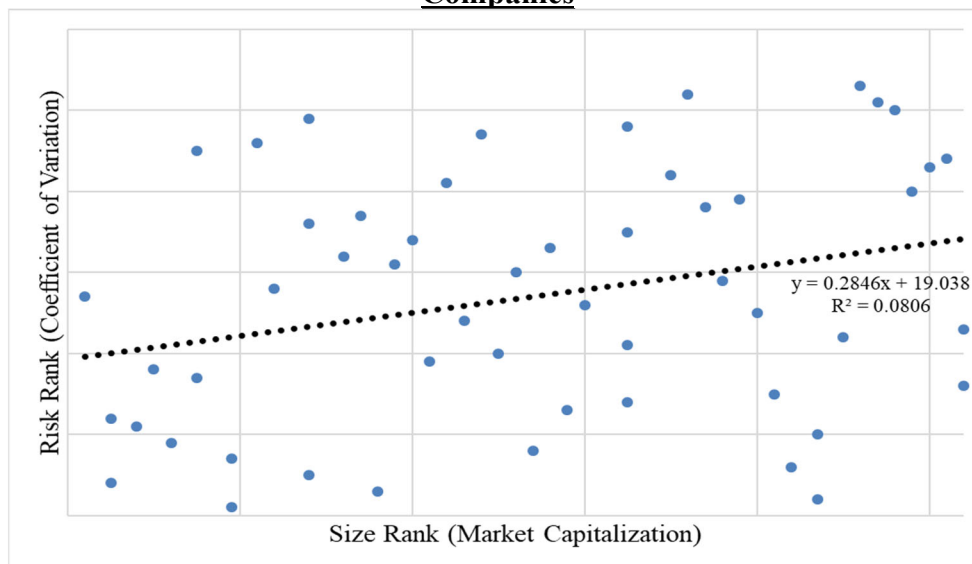
A. Yes, I have. I performed a study on whether or not the size effect is applicable to utilities. The study included the universe of electric, gas, and water companies included in Value Line Standard Edition. From each of the utilities’ Value Line Ratings & Reports, I calculated the ten-year CoV of net profit (a measure of risk) and current market capitalization (a measure of size) for each company. After ranking the companies by size

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<sup>42</sup> Due to BGWC’s financial statements not being consolidated for the five-year period ended 2018, I did not include the five-year net income and five-year EBITDA measures into the study.

(largest to smallest) and risk (least risky to most risky), I made a scatter plot of the data, as shown on Chart 2, below:

**Chart 2: Relationship Between Size and Risk for The Value Line Universe of Utility Companies**



As shown in Chart 2 above, as company size decreases (increasing size rank), the CoV increases, linking size and risk for utilities. The R-Squared of 0.08 means that approximately 8% of the change in risk rank is explained by the size rank.

**Q. MR. PARCELL ALSO STATES ON PAGE 45 OF HIS DIRECT TESTIMONY THAT “FOLLOWING MR. D’ASCENDIS’ REASONING, EACH OF THE SUBSIDIARIES OF THE PROXY COMPANIES SHOULD BE CONSIDERED AS RISKIER THAN THE PROXY GROUP SINCE, BY DEFINITION, THEY WOULD HAVE TO BE SMALLER.” PLEASE COMMENT.**

**A.** Following my reasoning as demonstrated in the quote above is tantamount to following portfolio theory, which theorizes that owning a basket of risky securities is less risky than individual owners owning separate securities. Utility holding companies invest in

individual operating utilities, all at their assumed individual levels of risk. As the utility holding company diversifies its holdings over several geographic and regulatory territories, the overall riskiness of the portfolio decreases even if some of the underlying individual securities are riskier than the portfolio. But this does not imply that the individual utilities held by the holding company are less risky.

**Q. IS MR. PARCELL’S “REASONING” CONSISTENT WITH THE STAND-ALONE NATURE OF RATEMAKING?**

A. No, it isn’t. Because it is the rate base of BGWC to which the overall rates of return set in this proceeding will be applied, BGWC should be evaluated as a stand-alone entity. To do otherwise would be discriminatory, confiscatory and inaccurate. It is also a basic financial precept that the use of the funds invested gives rise to the risk of the investment. As Brealey and Myers state:

The true cost of capital depends on the use to which the capital is put.

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***Each project should be evaluated at its own opportunity cost of capital; the true cost of capital depends on the use to which the capital is put.***  
(italics and bold in original)<sup>43</sup>

Morin confirms Brealey and Myers when he states:

Financial theory clearly establishes that the cost of equity is the risk-adjusted opportunity cost of the investors and not the cost of the specific capital sources employed by the investors. The true cost of capital depends on the use to which the capital is put and not on its source. The Hope and Bluefield doctrines have made clear that the relevant considerations in calculating a company’s cost of capital are the alternatives available to investors and the returns and risks associated with those alternatives.<sup>44</sup>

<sup>43</sup> Brealey and Myers, at 173, 198.

<sup>44</sup> Morin, at 523.

1           Additionally, Levy and Sarnat state:

2                   The firm's cost of capital is the discount rate employed to discount the  
3                   firm's average cash flow, hence obtaining the value of the firm. It is also  
4                   the weighted average cost of capital, as we shall see below. The weighted  
5                   average cost of capital should be employed for project evaluation... only  
6                   in cases where the risk profile of the new projects is a "carbon copy" of the  
7                   risk profile of the firm.<sup>45</sup>

8                   Although Levy and Sarnat discuss a project's cost of capital relative to a firm's cost  
9                   of capital, these principles apply equally to the use of a proxy group-based cost of capital.  
10                  Each company must be viewed on its own merits, regardless of the source of its equity  
11                  capital. As *Bluefield* clearly states:

12                   A public utility is entitled to such rates as will permit it to earn a return on  
13                   the value of the property which it employs for the convenience of the public  
14                   equal to that generally being made at the same time and in the same general  
15                   part of the country on investments in other business undertakings which are  
16                   attended by corresponding risks and uncertainties.<sup>46</sup>

17                  In other words, it is the "risks and uncertainties" surrounding the property employed  
18                  for the "convenience of the public" which determines the appropriate level of rates. In this  
19                  proceeding, the property employed "for the convenience of the public" is the rate base of  
20                  BGWC. Thus, it is only the risk of investment in BGWC's rate base that is relevant to the  
21                  determination of the cost of common equity to be applied to the common equity-financed  
22                  portion of that rate base.

23                  Consistent with the financial principle of risk and return discussed previously and  
24                  the stand-alone nature of ratemaking, an upward adjustment must be applied to the

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<sup>45</sup> Haim Levy & Marshall Sarnat, Capital Investment and Financial Decisions, Prentice/Hall International, 1986, at 465.

<sup>46</sup> *Bluefield Water Works Improvement Co. v. Public Serv. Comm'n*, 262 U.S. 679, 692 (1923).

1 indicated cost of common equity derived from the estimated costs of equity of the proxy  
2 groups used in this proceeding.

3 **Q. ON SCHEDULES 12 AND 13 OF EXHIBIT DCP-2, MR. PARCELL PURPORTS**  
4 **TO PROVIDE A “DEMONSTRATION” THAT SIZE IS NOT A FACTOR IN**  
5 **ASSESSING RISK. PLEASE COMMENT.**

6 A. Mr. Parcell’s Schedules 12 and 13 provide very broad measures of risk which Mr. Parcell  
7 assumes show no discernible pattern of risk differential for size. I disagree. As shown on  
8 Exhibit DCP-2, Schedule 12, the smallest company in the proxy group has a higher beta  
9 and a lower bond rating than the largest company in the proxy group, indicating increasing  
10 risk when size decreases. Similarly, on Exhibit DCP-2, Schedule 13, as company size  
11 increases, safety rank improves, beta decreases, financial strength improves, and S&P bond  
12 ratings improve. Based on the studies included in my direct and rebuttal testimonies in  
13 conjunction with Mr. Parcell’s corroborating evidence on Exhibit DCP-2, Schedules 12  
14 and 13 should reinforce that company size does indeed affect company risk.

15 **Q. WHAT IS MR. PARCELL’S CORRECTED ROE APPLICABLE TO BGWC?**

16 A. Adding a 50-basis-point size adjustment to the 10.10% midpoint of his corrected model  
17 results would indicate a range of ROEs between 10.10% and 10.60% for BGWC. I will  
18 note that Mr. Parcell’s corrected results would also overlap the top of my updated  
19 recommended range of ROEs.

E. **Response Mr. Parcell’s Criticisms of Company Direct Testimony**

20 **Q. DOES MR. PARCELL HAVE CRITICISMS OF YOUR DIRECT TESTIMONY?**

1 A. Yes. Mr. Parcell expresses six areas of concern regarding my direct testimony: (1) the use  
2 of the “relatively new” Predictive Risk Premium Model (“PRPM”); (2) market returns  
3 using Bloomberg and Value Line are unreasonably high; (3) the use of projected interest  
4 rates in my risk premium model (“RPM”) and CAPM analyses; (4) the use of the ECAPM;  
5 (5) the use of a non-regulated proxy group; and (6) my adjustments to the indicated  
6 common equity cost rate to reflect BGWC’s small size. Since I have addressed concerns  
7 (3) through (6) previously in this testimony, I will not repeat those discussions here and  
8 will focus on concerns (1) and (2).

9 **Q. MR. PARCELL DISCUSSES YOUR APPLICATION OF THE PRPM. PLEASE**  
10 **COMMENT.**

11 A. Mr. Parcell claims that the PRPM is “relatively new and untried.”<sup>47</sup> That is simply not the  
12 case. As discussed in my direct testimony,<sup>48</sup> the PRPM is based on the research of Robert  
13 F. Engle, dating back to the early 1980s. Dr. Engle discovered that the volatility of market  
14 prices, returns and risk premiums clusters over time, making prices, returns and risk  
15 premiums highly predictable. In 2003, he shared the Nobel Prize in Economics for this  
16 work, characterized as “methods of analyzing economic time series with time-varying

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<sup>47</sup> Direct Testimony of ORS Witness Parcell at 40.

<sup>48</sup> Direct Testimony of Blue Granite Witness D’Ascendis at 17.



1 volatility (“ARCH”).<sup>49</sup> Dr. Engle<sup>50</sup> noted that relative to volatility, “the standard tools have  
2 become the ARCH / GARCH<sup>51</sup> models.” Hence, the methodology is not new.

3 In addition, the GARCH methodology has been well tested by academia, since  
4 Engle’s, *et al.* research was originally published in 1982, 38 years ago. I use the well-  
5 established GARCH methodology to estimate the PRPM model using a standard  
6 commercial and relatively inexpensive statistical package, Eviews,<sup>©52</sup> to develop a means  
7 by which to estimate a predicted equity risk premium which, when added to a bond yield,  
8 results in a cost of common equity.

9 Also, the PRPM is in the public domain, having been published four times in  
10 academically peer-reviewed journals, *The Journal of Regulatory Economics* (December  
11 2011) and *The Electricity Journal* (May 2013 and March 2020), and *Energy Policy* (April  
12 2019). Notably, none of these articles have been rebutted in the academic literature.

13 Finally, the PRPM has also been presented to a number of utility industry /  
14 regulatory / academic groups including the following: The Edison Electric Institute Cost  
15 of Capital Working Group; The NARUC Staff Subcommittee on Accounting and Finance;  
16 The National Association of Electric Companies Finance / Accounting / Taxation and

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<sup>49</sup> [www.nobelprize.org](http://www.nobelprize.org).

<sup>50</sup> Robert Engle, “GARCH 101: The Use of ARCH / GARCH Models in Applied Econometrics”, *Journal of Economic Perspectives*, Volume 15, No. 4, Fall 2001, at 157-168.

<sup>51</sup> Autoregressive Conditional Heteroskedasticity / Generalized Autoregressive Conditional Heteroskedasticity.

<sup>52</sup> In addition to Eviews,<sup>®</sup> the GARCH methodology can be applied and the PRPM derived using other standard statistical software packages as SAS, RATS, S-Plus and JMulti, which are not cost-prohibitive. The software that I used in this proceeding Eviews,<sup>®</sup> currently costs \$600 - \$700 for a single user commercial license. In addition, JMulti is a free downloadable software with GARCH estimation applications.

1 Rates and Regulations Committees; the NARUC Electric Committee; The Wall Street  
 2 Utility Group; the Indiana Utility Regulatory Commission Cost of Capital Task Force; the  
 3 Financial Research Institute of the University of Missouri Hot Topic Hotline Webinar; and  
 4 the Center for Research and Regulated Industries Annual Eastern Conference on two  
 5 occasions. The PRPM was also presented to the Asset Supervision and Administration  
 6 Commission of the State Council of the Peoples Republic of China.

7 **Q. HAS THE PRPM BEEN IMPLICITLY ACCEPTED BY THIS COMMISSION?**

8 A. Yes. In Docket No. 2017-292-WS, the Commission accepted the Company's entire  
 9 requested ROE, which included the PRPM. The relevant portion states:

10 The Commission finds Mr. D'Ascendis' arguments persuasive. He provided  
 11 more indicia of market returns, by using more analytical methods and proxy  
 12 group calculations. Mr. D'Ascendis' use of analysts' estimates for his DCF  
 13 analysis is supported by consensus, as is his use of the arithmetic mean. The  
 14 Commission also finds that Mr. D'Ascendis' non-price regulated proxy  
 15 group more accurately reflects the total risk faced [by] price regulated  
 16 utilities and CWS. Furthermore, there is no dispute that CWS is  
 17 significantly smaller than its proxy group counterparts, and, therefore, it  
 18 may present a higher risk. An appropriate ROE for CWS is 10.45% to  
 19 10.95%. The Company used an ROE of 10.5% in computing its  
 20 Application, a return on the low end of Mr. D'Ascendis' range, and the  
 21 Commission finds that ROE is supported by the evidence.

22 **Q. MR. PARCELL OPINES THAT THE MARKET RETURNS GENERATED BY**  
 23 **CALCULATING THE MARKET DCF USING VALUE LINE AND BLOOMBERG**  
 24 **DATA ARE CLEARLY OUTLIERS.<sup>53</sup> PLEASE RESPOND.**

25 A. In my direct testimony, I used market returns ranging from 11.89% to 14.52%<sup>54</sup> and in my  
 26 updated ROE analysis contained in Schedule DWD-1R, I used market returns ranging from

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<sup>53</sup> Direct Testimony of ORS Witness Parcell at 41.

<sup>54</sup> Direct Testimony of Blue Granite Witness D'Ascendis at Schedule DWD-5, page 2.

1 11.01% (implied PRPM MRP plus the projected risk-free rate of 2.70%) and 14.53%.  
2 Based on the historical returns from 1926-2018 from SBBI-2019,<sup>55</sup> the range of market  
3 returns used in my analyses fall between the 44<sup>th</sup> and 51<sup>st</sup> percentiles of all historical  
4 returns, meaning that the market returns I rely on are in the middle of the road given  
5 historical market returns. Given that the historical standard deviation of market returns is  
6 approximately 20%, my projected market returns are not outliers.

7 **VI. RESPONSE TO MR. ROTHSCHILD**

8 **Q. PLEASE PROVIDE A SUMMARY OF MR. ROTHSCHILD'S DIRECT**  
9 **TESTIMONY AND RECOMMENDATIONS.**

10 A. Mr. Rothschild agrees with the Company's recommendations regarding capital structure  
11 and long-term debt cost rate,<sup>56</sup> but does not agree with the Company's requested cost of  
12 common equity. Mr. Rothschild derives an 8.47% cost of common equity based on the  
13 high results of his constant growth DCF model, his "non-constant" DCF and his CAPM  
14 using 30-year Treasury bonds. From his 8.47% average result, he applies a 28-basis point  
15 upward adjustment for size<sup>57</sup> and a 10-basis point downward adjustment for financial risk,  
16 which results in his 8.65% recommendation for BGWC.<sup>58</sup>

17 **Q. DO YOU HAVE ANY GENERAL COMMENTS REGARDING MR.**  
18 **ROTHSCHILD'S CONCLUSIONS AND RECOMMENDATIONS?**

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<sup>55</sup> SBBI-2019, at Appendix A.

<sup>56</sup> Direct Testimony of Consumer Advocate Witness Rothschild at 3.

<sup>57</sup> *Ibid.*, at 7.

<sup>58</sup> *Ibid.*, at 6.

1 A. Yes. While my recommended range of ROEs overlaps Mr. Parcell's recommended range,  
2 Mr. Rothschild's recommended ROE is below the bottom of Mr. Parcell's recommended  
3 range. Additionally, if Mr. Rothschild's recommended ROE was approved by this  
4 Commission, it would be the lowest ROE approved for a water / wastewater utility in the  
5 United States.

6 **Q. PLEASE SUMMARIZE THE KEY AREAS WITH WHICH YOU DISAGREE**  
7 **WITH MR. ROTHSCILD'S ANALYSES AND RECOMMENDATIONS.**

8 A. The principal areas in Mr. Rothschild's analyses with which I disagree include his  
9 interpretation of current and expected market conditions, his undue weight given to and the  
10 application of both his constant growth and non-constant growth DCF models, his  
11 application of the CAPM, and his financial risk adjustment.

**A. Current Market Environment**

12 **Q. WHY IS MR. ROTHSCILD'S 8.65% COMMON EQUITY COST RATE BEFORE**  
13 **ADJUSTMENT BASED ON A FLAWED INTERPRETATION OF CURRENT**  
14 **MARKET CONDITIONS?**

15 A. Mr. Rothschild addresses four components of current capital market conditions in his direct  
16 testimony.<sup>59</sup> They are:

- 17 • Stocks are Expensive (high price to earnings ("P/E") Ratios);
- 18 • Interest Rates (still historically low interest rates);
- 19 • Low Credit Spreads; and
- 20 • Volatility Expectations.

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<sup>59</sup> *Ibid.*, at 12.

1 I will address each in turn and show that his interpretation that the cost of equity is  
2 low and will continue to remain low, is misplaced.

3 **Q. DOES MR. ROTHSCHILD’S CLAIM THAT STOCKS ARE EXPENSIVE**  
4 **INDICATE THAT THE COST OF EQUITY IS LOWER THAN AVERAGE?**

5 A. No. Mr. Rothschild states in his direct testimony<sup>60</sup> that “favorable economic conditions  
6 have led to high P/E ratios for utility stocks”, which leads him to the opinion that “the cost  
7 of equity for utility companies is at historical lows.” Mr. Rothschild is mistaken. He fails  
8 to recognize a very simple relationship between P/E ratios, growth rates, and the resulting  
9 investor expected return. That relationship is that as P/E ratios increase (which lowers  
10 dividend yields in the DCF model), prospects for growth increase, which usually keeps the  
11 expected return on common equity relatively constant over time, consistent with the  
12 principles of the constant growth DCF model. This is consistent with Veerapan Perianan,  
13 who states:

14 The expansion of P/E ratios could be due to various reasons, including  
15 investor optimism about higher future earnings, less aversion to risk and  
16 lower interest rates. The rise in P/E ratios boosted average returns for  
17 stocks, but it is unrealistic to expect similar P/E growth over the next 10  
18 years.<sup>61</sup>

19 **Q. DOES THE PROXY GROUP DATA REFLECT THE RELATIONSHIP BETWEEN**  
20 **P/E RATIOS AND EXPECTED GROWTH?**

21 A. Yes, it does. Table 4 (below) shows the average P/E ratio and expected EPS growth rates  
22 of the proxy group in BGWC’s last rate case (2017) and in this rate case, provided by Value

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<sup>60</sup> *Ibid.*, at 11.

<sup>61</sup> Veerapan Perianan, “Why Market Returns May Be Lower in the Future”, © Charles Schwab & Co., Inc. March 13, 2017.

Line. In the 2017 rate case, the average P/E ratio of the proxy group was 27.7 and its average expected EPS growth rate was 7.33%. In this rate case, the proxy group average P/E ratio is 36.7 and the average expected EPS growth rate is 8.25%.

**Table 4: P/E Ratios and Expected EPS Growth Rates of Proxy Group**  
**in 2017 and 2020**

	2017 <sup>62</sup>			2020 <sup>63</sup>		
	P/E Ratio	Dividend Yield	EPS Growth	P/E Ratio	Dividend Yield	EPS Growth
Utility Proxy Group	27.7	1.88%	7.33%	36.7	1.58%	8.25%

As the Table shows, the proxy group's P/E ratio increases from 2017 to 2020, which predictably lowers the dividend yield 30 basis points. Because of the increase in the P/E ratio, there is expectation of higher growth, which is reflected in higher projected EPS growth rates. If one calculated a constant growth DCF from this data, one would compute a 9.28%<sup>64</sup> indicated ROE based on 2017 data and an indicated ROE of 9.90%<sup>65</sup> based on 2020 data, which indicates an increasing cost of capital, not a decreasing one.

**Q. MR. ROTHSCILD REJECTS THE USE OF PROJECTED INTEREST RATES IN HIS ANALYSIS BECAUSE "CURRENT LONG-TERM INTEREST RATES REPRESENT A DIRECT OBSERVATION OF INVESTOR EXPECTATIONS".<sup>66</sup> PLEASE RESPOND.**

<sup>62</sup> Value Line Investment Survey, Standard Edition, October 13, 2017.

<sup>63</sup> Value Line Investment Survey, Standard Edition, January 10, 2020.

<sup>64</sup>  $1.88\% * (1 + (0.5 * 7.33\%)) + 7.33\% = 9.28\%$

<sup>65</sup>  $1.58\% * (1 + (0.5 * 8.25\%)) + 8.25\% = 9.90\%$

<sup>66</sup> Direct Testimony of Consumer Advocate Witness Rothschild at 16.

1 A. Mr. Rothschild's statement ignores the important fact that both ratemaking and the cost of  
2 capital are prospective in nature, *i.e.*, forward looking, as rates set in this proceeding will  
3 be collected over a future time period as discussed previously. Therefore, it is the level of  
4 future interest rates which is relevant to the cost of equity for BGWC in this proceeding,  
5 not present interest rates.

6 **Q. DOES MR. ROTHSCILD BELIEVE THAT THE COST OF CAPITAL IS TO BE**  
7 **SET ON EXPECTED MARKET CONDITIONS?**

8 A. No, he does not. On page 22 of his direct testimony he states that "The cost of capital is  
9 the return investors require to provide capital to BGWC based on current capital markets.  
10 My cost of equity ("COE") recommendation is my opinion of the return investors require  
11 to provide equity capital to BGWC based on current capital markets."

12 **Q. IS THERE SUFFICIENT EVIDENCE IN THE FINANCIAL LITERATURE THAT**  
13 **MR. ROTHSCILD IS MISTAKEN IN BELIEVING THAT NOTION?**

14 A. Yes, there is. In Chapter 1, page 1 of D&P 2019, several definitions of the cost of capital  
15 are presented:

16 The cost of capital is the *expected* rate of return that the market requires in  
17 order to attract funds to a particular investment. – Shannon P. Pratt and  
18 Roger J Grabowski, Co-Authors of Cost of Capital, 5<sup>th</sup> Edition

19 The opportunity cost of capital is one of the most important concepts in  
20 finance. For example, if you are a chief finance officer contemplating a  
21 possible capital expenditure, you need to know what return you should look  
22 to earn from the investment. If you are an investor who needs to plan for  
23 future expenditures, you need to ask what return you can *expect* to earn on  
24 your portfolio. – Richard Brealey, London Business School

25 The cost of capital is the price charged by investors for bearing the risk that  
26 the company's *future cash flows* may differ from what they *anticipated*  
27 when they made the investment – McKinsey

1 The cost of capital may be described in simple terms as the *expected return*  
 2 *appropriate for the expected level of risk.*<sup>67</sup>

3 Mr. Parcell's book, "Cost of Capital – A Practitioner's Guide", the primary text  
 4 used for the Certified Rate of Return Analyst designation of the Society of Utility and  
 5 Regulatory Financial Analysts, breaks down the cost of capital into three conceptual  
 6 meanings:

- 7 1. On the asset side of a firm's balance sheet, it is the discount rate which  
 8 should be used to reduce the future value of cash flows derived from the  
 9 assets to a present value.
- 10 2. On the liability side, it is economic cost to the firm of attracting and  
 11 retaining capital in a competitive environment where investors (capital  
 12 providers) carefully analyze and compare all return-generating  
 13 opportunities.
- 14 3. To the investor, it is the return one expects and requires from one's  
 15 investment in a firm's debt or equity.

16 The cost of capital, using any of these meanings, is thus an opportunity  
 17 cost, which is defined as the highest alternative return on an investment  
 18 of similar risk. From the perspective of public utility rate regulation,  
 19 the cost of capital focuses on the second and third conceptual meanings  
 20 discussed above.<sup>68</sup>

21 Phillips says the following about the nature of cost of capital:

22 The most difficult problem in determining the overall cost of capital arises  
 23 in estimating the cost of equity capital. The relevant question is: How much  
 24 must a utility earn to induce investors to hold and to continue to buy  
 25 common stock? In answering this question, it is important to realize that  
 26 circular reasoning is involved. In the absence of a fixed, expressed or  
 27 implied commitment as to the dividend rate, the actual cost of floating a  
 28 stock issue is indeterminate. Investors' decisions are largely on a utility's  
 29 *expected earnings* and upon their stability, as well as upon other uses of  
 30 investment funds... There are several approaches for estimating the cost of  
 31 equity capital, but two methods have evolved in recent years: the "market-  
 32 determined" standard and the "comparable earnings" standard.<sup>100</sup> (footnote  
 33 omitted) The former is a market-oriented approach that focuses on investor

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<sup>67</sup> D&P 2017, at 1-1 (emphasis added).

<sup>68</sup> David C. Parcell, The Cost of Capital – A Practitioner's Guide, 2010 Edition, at 1 (emphasis in original).



1            *expectations* in terms of a utility's earnings, dividends, and market prices.  
2            The latter is an alternative investment approach that focuses on what capital  
3            can earn in various alternatives with comparable risk.<sup>69</sup>

4            These treatises on the cost of capital demonstrate that Mr. Rothschild's contention  
5            that the cost of capital is based on current capital markets is misplaced and should be  
6            rejected by the Commission.

7    **Q.    DOES MR. ROTHSCHILD'S CONTENTION THAT FORECASTED INTEREST**  
8           **RATES ARE NOT ACCURATE AFTER THE FACT RELEVANT TO**  
9           **INVESTOR'S EXPECTATIONS AT THIS TIME?**

10   **A.**    No. Contrary to Mr. Rothschild's assumption, it is not the accuracy of the forecasts that is  
11           relevant, but whether or not investor expectations reflect those forecasts. Investor reaction  
12           to analysts' forecasts, whether they be growth rate or interest rate forecasts, can be likened  
13           to weather forecasts. For example, typically one prepares for forecasted severe weather,  
14           *i.e.*, snowstorms and / or hurricanes, regardless of the historical accuracy of, or any inherent  
15           bias in, the weather forecasting. When severe weather is forecasted, those expected to be  
16           affected generally begin preparing by storing supplies of food, batteries, candles, etc. If  
17           the severe weather does not materialize, apparently that does not stop them from making  
18           the same preparations the next time severe weather is predicted.

19           Using Mr. Rothschild's logic regarding forecasts, be they growth or interest rate  
20           forecasts, namely that these forecasts are reflected in the market prices investors pay,  
21           means that there would be no need to use an expected dividend yield based on the growth  
22           rate which is added to the expected growth rate in the application of the DCF model.

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<sup>69</sup> Phillips, at 394 (emphasis added).

1 Financial theory informs us that expectations of future earnings and interest rate levels, in  
2 part are evaluated by investors when making their investment decisions. As discussed in  
3 my direct testimony:

4 The theory underlying the DCF model is that the present value of an  
5 *expected* future stream of net cash flows during the investment holding  
6 period can be determined by discounting those cash flows at the cost of  
7 capital, or the investors' capitalization rate. DCF theory assumes that an  
8 investor buys a stock for an *expected* total return rate which is derived from  
9 cash flows received in the form of dividends plus appreciation in market  
10 price (the *expected* growth rate). (italics added)<sup>70</sup>  
11

12 In addition, the CAPM is defined as an *expected* risk-free rate added to an *expected*  
13 market risk premium adjusted by a company or proxy group specific beta to determine the  
14 investor's *expected* required return. Mr. Rothschild's "logic" is thus at odds with financial  
15 theory, DCF theory and the CAPM.

16 In addition, interest rate forecasts are as market-based as the forecasts of the  
17 sustainable growth ("BR + SV") methodology and Zacks forecasts of EPS growth relied  
18 on by Mr. Rothschild. Moreover, there are approximately 50 economists who contribute  
19 to *Blue Chip*, on which I have relied in my common equity cost rate analysis. To suggest  
20 that these economists be ignored by the investment community is counter to the Efficient  
21 Market Hypothesis ("EMH"), which in its "semi-strong" form postulates that all publicly  
22 available information informs investor expectations. The EMH, which is the foundation of  
23 modern investment theory, was pioneered by Eugene F. Fama<sup>71</sup> in 1970. An efficient  
24 market is one in which security prices reflect all relevant information all the time, with the

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<sup>70</sup> Direct Testimony of Blue Granite Witness D'Ascendis at 14.

<sup>71</sup> Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work", 383-417 (Journal of Finance, May 1970).

1       implication that prices adjust instantaneously to new information, thus reflecting the  
2       intrinsic fundamental economic value of a security.<sup>72</sup>

3               The generally-accepted “semi strong” form of the EMH asserts that all publicly  
4       available information is fully reflected in securities prices, *i.e.*, that fundamental analysis  
5       cannot enable an investor to “out-perform the market” in the long-run, as noted by Brealey  
6       and Myers.<sup>73</sup> The “semi strong” form of the EMH is generally held to be true because the  
7       use of insider information often enables investors to earn excessive returns by  
8       “outperforming the market” in the short-run. This means that investors take into account,  
9       in the prices they pay for securities, all perceived risks and publicly-available information,  
10      such as bond / credit ratings, discussions about companies by bond / credit rating agencies,  
11      and investment analysts, published information such as growth and interest rate forecasts,  
12      as well as the discussions of the various common equity cost rate methodologies (models)  
13      in the financial literature. In an attempt, then, to emulate investor behavior, both growth  
14      rate and interest rate forecasts should be used in the estimation of the common equity cost  
15      rate along with the application of multiple cost of common equity cost models.

16   **Q.   WHAT IS YOUR RESPONSE TO MR. ROTHSCHILD’S CLAIM THAT A**  
17   **CONGRESSIONAL BUDGET OFFICE (“CBO”) REPORT SUPPORTS HIS**  
18   **POSITION THAT *BLUE CHIP*’S FORECASTS ARE UPWARDLY BIASED?**<sup>74</sup>

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<sup>72</sup> Morin, at 279-281.

<sup>73</sup> Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance (McGraw-Hill Book Company, 1988) at 329.

<sup>74</sup> Direct Testimony of Consumer Advocate Witness Rothschild at 18-19.

1 A. The cost of common equity depends on what the market expects, not what has already  
2 happened in hindsight. As such, I believe the relevant issue is whether investors are likely  
3 to rely on those *Blue Chip* consensus forecasts when making investment decisions. That  
4 point aside, the CBO releases a biennial report reviewing its forecasting record. In its most  
5 recent Economic Forecasting Record update, the CBO noted its forecasting record was  
6 “roughly comparable”<sup>75</sup> to *Blue Chip*’s. Additionally, *Blue Chip* has been published  
7 consistently since 1980. If its information were ignored by investors, the publication would  
8 have been discontinued.

9 **Q. AT PAGE 19 OF HIS DIRECT TESTIMONY, MR. ROTHSCILD CLAIMS THAT**  
10 **CREDIT SPREADS BETWEEN 10-YEAR TREASURY BONDS AND MOODY’S**  
11 **BAA CORPORATE BONDS ARE A PROXY FOR THE COST OF EQUITY. DO**  
12 **YOU AGREE?**

13 A. No, I do not. To test Mr. Rothschild’s claim, I incorporated Mr. Rothschild’s data in his  
14 Chart 5 on page 20 of his direct testimony and added the monthly authorized returns for  
15 electric and gas companies from January 2007 through December 2019 to form a scatter  
16 plot to see if there was any relationship between credit spreads and the cost of capital.

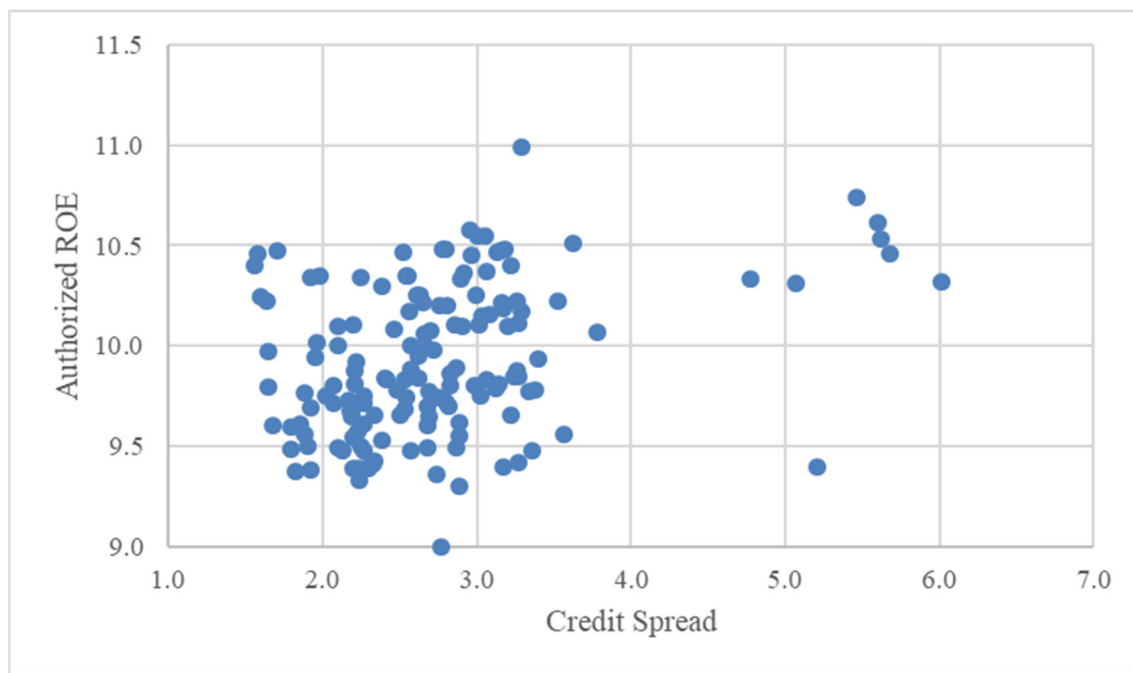
17 **Q. WHAT DID THAT ANALYSIS REVEAL?**

18 A. As shown on Chart 3 below, there was no meaningful pattern between credit spreads and  
19 authorized ROEs from utility regulatory commissions.

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<sup>75</sup> CBO’s *Economic Forecasting Record: 2019 Update*, October 2019, at 3.

**Chart 3: Scatter Plot of Credit Spreads and Authorized Returns on Common Equity**  
**January 2007 through December 2019**



**Q. PLEASE DISCUSS MR. ROTHSCHILD’S ASSESSMENT OF THE CURRENT LOW VOLATILITY OF THE OVERALL MARKET AS MEASURED BY THE VOLATILITY INDEX (“VIX”) AND ITS RELATIONSHIP TO THE COST OF EQUITY.**

**A.** Mr. Rothschild notes that the VIX, or “Fear Index”, reflects the expected volatility of the S&P 500 index over the coming 30 days on an annual basis.<sup>76</sup> He then notes that the VIX “is significantly lower than it was during the financial crisis and is nearing pre-crisis levels.”<sup>77</sup>

<sup>76</sup> Direct Testimony of Consumer Advocate Witness Rothschild at 21.

<sup>77</sup> *Ibid.*

1 **Q. DO YOU HAVE ANY OPINION REGARDING THE IMPLICATIONS OF THE**  
2 **VIX AND THE COST OF EQUITY?**

3 A. Yes, I do. As described by Mr. Rothschild, the VIX measures the expected volatility of  
4 the S&P 500 30 days into the future. Because the cost of capital is a long-term concept  
5 (i.e. perpetuity in the case of the DCF model), the VIX is irrelevant to the cost of common  
6 equity in this proceeding.

7 **Q. ARE THERE OTHER LONGER-TERM MEASURES OF EXPECTED**  
8 **VOLATILITY THAN THE VIX?**

9 A. Yes, there are. The Chicago Board of Options Exchange (“CBOE”), which publishes the  
10 VIX, also publishes the “Term Structure of Volatility” (“Term Structure”), which provides  
11 a measure of expected longer-term volatility, currently through December 2020. Thus, the  
12 Term Structure represents a measure of expected volatility longer than the 30-day VIX. As  
13 of January 27, 2020, per the Term Structure, the expected level of the VIX in December  
14 2020 is 18.66%<sup>78</sup>, which is significantly higher than the 13.78% level cited by Mr.  
15 Rothschild.<sup>79</sup>

## **B. Application of the DCF Model**

### **i. Significant Weighting of DCF Model Results**

17 **Q. DOES MR. ROTHSCILD RELY HEAVILY ON HIS DCF RESULTS?**

18 A. Yes. Mr. Rothschild gives equal weight to his constant growth DCF, his non-constant  
19 growth DCF and his CAPM (using 30-year Treasury bonds) to arrive at his initial ROE

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<sup>78</sup> <http://www.cboe.com/trading-tools/strategy-planning-tools/term-structure-data>.

<sup>79</sup> Direct Testimony of Consumer Advocate Witness Rothschild at 21.

1 recommendation, effectively giving 2/3 weight to DCF models in his analysis. As  
2 discussed previously regarding Mr. Parcell's direct testimony, DCF model results should  
3 be viewed with caution due to current market conditions.

4 **ii. Application of the Constant Growth DCF Model**

5 **Q. DO YOU HAVE ANY GENERAL COMMENTS ON MR. ROTHSCCHILD'S**  
6 **APPLICATION OF THE CONSTANT GROWTH DCF?**

7 A. Yes. Mr. Rothschild's application of the Constant-Growth DCF is flawed because he relied  
8 on the sustainable growth methodology to derive the growth rate component in his model.

9 **Q. DO YOU AGREE WITH MR. ROTHSCCHILD'S RELIANCE ON SUSTAINABLE**  
10 **GROWTH IN HIS CONSTANT-GROWTH DCF ANALYSIS?**

11 A. No. Mr. Rothschild's Constant-Growth DCF growth rate utilizes the BR + SV  
12 methodology for determining the growth rate component<sup>80</sup>. Mr. Rothschild calculates  
13 sustainable growth based on expected retention of earnings as well as the increase in  
14 common shares.

15 In Schedule ALR 2, it is clear that the ROE used in Mr. Rothschild's growth rate  
16 analysis is based, in part, on expectations by Value Line as well as Zacks five-year forecasts  
17 of EPS growth. His allowance for growth caused by the sale of new common stock above  
18 book value is based in part on the expected five-year growth in shares from 2014 through  
19 2022 – 2024 from Value Line.<sup>81</sup> Hence, Mr. Rothschild's sustainable growth methodology  
20 is not only a short-term forecast, no longer than the security analysts' five-year forecasts

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<sup>80</sup> *Ibid.*, at 32-38.

<sup>81</sup> Direct Testimony of Consumer Advocate Witness Rothschild at Schedule ALR 5.

1 of EPS growth used in my DCF analysis, but it also relies on analysts' growth forecasts, a  
2 practice Mr. Rothschild has criticized.

3 Mr. Rothschild's sustainable growth methodology is inherently circular because:  
4 (1) it relies on an expected ROE on book common equity; (2) that expected ROE on book  
5 common equity is then used in a DCF analysis to establish an ROE cost rate related to the  
6 market value of the common stock; and (3) that market-related ROE, if authorized as the  
7 allowed ROE in this proceeding, will become the expected ROE on book common equity.  
8 Put simply, the ROEs Mr. Rothschild uses in the derivation of his sustainable growth rate,  
9 which are used in a Constant-Growth DCF analysis (the results of which he recommends)  
10 become the regulatory outcome of this proceeding and are themselves based on regulatory  
11 outcomes. In addition, the resultant conclusion of DCF derived ROE on book common  
12 equity of 8.47% is significantly lower than the expected average / median Value Line ROE  
13 of 13.00% / 12.75%<sup>82</sup> for his very own proxy group. Note, too, that these Value Line  
14 expected ROEs exceed my recommended range of common equity cost rates of 9.75% to  
15 10.25%.

16 The circularity and inconsistency of Mr. Rothschild's use of the sustainable growth  
17 methodology is recognized in the academic literature. Specifically, Morin<sup>83</sup> states the  
18 following:

19 There are three problems in the practical application of the sustainable  
20 growth method. The first is that it may be even more difficult to estimate  
21 what b, r, s and v investors have in mind than it is to estimate what g is they  
22 envisage. It would appear far more economical and expeditious to use  
23 available growth forecasts and obtain g directly instead of relying on four

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<sup>82</sup> *Ibid.*, at Schedule ALR 4, page 1, Note [A].

<sup>83</sup> Morin, at 306-307.



individual forecasts of the determinants of such growth. *It seems only logical that the measurement and forecasting errors inherent in using four different variables to predict growth far exceed the forecasting error inherent in the direct forecast of growth itself.*

*Second, there is a potential element of circularity in estimating  $g$  by a forecast of  $b$  and ROE for the utility being regulated, since ROE is determined in large part by regulation. To estimate what ROE resides in the minds of investors is equivalent to estimating the market's assessment of the outcome of regulatory hearings. Expected ROE is exactly what regulatory commissions set in determining an allowed rate of return. In other words, the method requires an estimate of return on equity before it can even be implemented. Common sense would dictate the inconsistency of a return on equity recommendation that is different than the expected ROE that the method assumes the utility will earn forever. For example, using an expected return on equity of 11% to determine the growth rate and using the growth rate to recommend a return on equity of 9% is inconsistent. It is not reasonable to assume that this regulatory utility company is expected to earn 11% forever, but recommend a 9% return on equity. The only way this utility can earn 11% is that rates be set by the regulator so that the utility will, in fact, earn 11%....*

Third, the empirical finance literature discussed earlier demonstrates that the sustainable growth method of determining growth is not as significantly correlated to measures of value, such as stock price and price/earnings ratios, as other historical measures or analysts' growth forecasts. *Other proxies for growth such as historical growth rates and analysts' growth forecasts outperform retention growth estimates.* (italics added)

In view of the foregoing, it is clear that Mr. Rothschild's application of the DCF is flawed due to his use of  $BR + SV$ , which is an exercise in circularity and ignores the basic principle of rate base / rate of return regulation. That is, it ignores the fact that the cost of equity which will be authorized in this proceeding will be applied to the jurisdictional book value rate base of BGWC and become the allowed future earned return on book common equity, *i.e.*, the expected ROE component of the sustainable growth method.

1 **Q. DO YOU HAVE AN OBSERVATION REGARDING MR. ROTHSCILD'S**  
2 **INPUTS IN HIS BR + SV FORMULA?**

3 A. Yes. On page 5 of Schedule ALR 5, Mr. Rothschild presents his recommended external  
4 financing rate or "S" in his BR + SV formula. As shown on Schedule ALR 5, Mr.  
5 Rothschild uses an average financing rate of 0.63%, which spans the period from 2014-  
6 2023. According to his note [B] on that page, Mr. Rothschild claims to eliminate negative  
7 growth rates in his analysis, but negative growth rates are clearly seen in columns 9 through  
8 11 of the Schedule. If it was Mr. Rothschild's intention to eliminate negative growth rates  
9 from his analysis, the 2014-2023 external financing rate would be 1.00%.

10 **Q. ALL ELSE EQUAL, WHAT WOULD MR. ROTHSCILD'S CONSTANT**  
11 **GROWTH DCF RESULTS BE IF HE APPLIED THE 1.00% "S" FACTOR TO THE**  
12 **WATER PROXY GROUP DATA?**

13 A. As shown on Schedule DWD-12, Mr. Rothschild's constant growth DCF results would  
14 range from 9.80% to 9.47%, significantly different from his original results, which ranged  
15 from 8.34% to 8.76%. The 9.80% to 9.74% indicated results still do not reflect BGWC's  
16 increased risk compared to the proxy group based on its small relative size as discussed in  
17 my direct testimony.<sup>84</sup>

18 **Q. HAS MR. ROTHSCILD CRITICIZED THE USE OF FORECASTS OF EPS**  
19 **GROWTH IN THE DCF MODEL?**

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<sup>84</sup> Direct Testimony of Blue Granite Witness D'Ascendis at 36-41.

1 A. Yes. On pages 60 through 65 of his direct testimony, Mr. Rothschild criticizes my use of  
2 projected EPS growth rates in my DCF analysis, seemingly ignoring his statement on page  
3 59 of his direct testimony:

4           Currently, his [Mr. D'Ascendis'] growth rates are reasonable and therefore  
5           his 9.03% DCF result is on the high side of reasonable for setting rates in  
6           this proceeding. [clarification added]

7           Considering the above statement, Mr. Rothschild is creating an issue where one  
8           does not exist.

9 **Q. PLEASE DISCUSS THE SUPERIORITY OF PROJECTED EPS GROWTH**  
10 **RATES IN A DCF ANALYSIS.**

11 A. Rate of return analysts must attempt to emulate investor behavior in their rate of return  
12 analyses and evaluate those factors that influence investor behavior. Security analysts'  
13 forecasted EPS growth rates are one such factor. As discussed previously in my direct  
14 testimony,<sup>85</sup> and noted by Morin, what is relevant to investor behavior is the fact that  
15 security analysts' forecasted EPS growth rates influence investors' pricing decisions.  
16 Moreover, both the cost of common equity as well as ratemaking by this Commission are  
17 prospective or forward-looking. The cost of common equity is forward-looking as it is a  
18 function of investor expectations. Likewise, this Commission's ratemaking is forward-  
19 looking as rates set in this proceeding will be in effect in a future period.

20           Mr. Rothschild's criticism of the use of analysts' forecasts also ignores the  
21 significant body of empirical evidence indicating the superiority of analysts' EPS growth  
22 rates in a DCF analysis and that analysts' forecasts of earnings remain the best predictor of

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<sup>85</sup> Direct Testimony of Blue Granite Witness D'Ascendis at 15.

1 growth to use in the DCF model. Mr. Rothschild has no justification for ignoring such  
2 ample evidence of the proven reliability and superiority of analysts' forecasts of EPS.  
3 Implicitly, as discussed previously, Mr. Rothschild acknowledges as much when he uses  
4 an expected dividend yield in his DCF analysis, which is forward looking, using analysts'  
5 projected growth rates, in part, to derive the BR + SV growth rate he uses to calculate the  
6 expected dividend yield.

7 **Q. PLEASE DESCRIBE SOME OF THE EMPIRICAL EVIDENCE SUPPORTING**  
8 **THE RELIABILITY AND SUPERIORITY OF ANALYSTS' EPS GROWTH**  
9 **RATES IN A DCF ANALYSIS.**

10 A. As discussed in my direct testimony,<sup>86</sup> over the long run, there can be no growth in DPS  
11 without growth in EPS. While security analysts' earnings expectations are not the only  
12 influence on market prices, they have a more significant influence on market prices than  
13 dividend expectations. Thus, the use of projected earnings growth rates in a DCF analysis  
14 provides a better match between investors' market price appreciation expectations and the  
15 growth rate component of the DCF. This is because projected earnings growth rates have  
16 a significant influence on market prices and the appreciation or "growth" experienced by  
17 investors.<sup>87</sup> This should be evident even to relatively unsophisticated investors just by  
18 listening to financial news reports on radio, TV or reading the newspapers.

19 In addition, Myron Gordon, the "father" of the standard regulatory version of the  
20 DCF model widely utilized throughout the United States in rate base / rate of return

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<sup>86</sup> *Ibid.*

<sup>87</sup> Morin, at 298-303.

1 regulation, recognized the significance of analysts' forecasts of growth in EPS in a speech  
2 he gave in March 1990 before the Institute for Quantitative Research and Finance.<sup>88</sup> As  
3 Professor Gordon stated:<sup>89</sup>

4 We have seen that earnings and growth estimates by security analysts were  
5 found by Malkiel and Cragg to be superior to data obtained from financial  
6 statements for the explanation of variation in price among common stocks.  
7 . . (p. 12)

8 Professor Gordon recognized that total return is largely affected by the terminal  
9 price which is mostly affected by earnings (hence price earnings multiples). However,  
10 while EPS is the most significant factor influencing market prices, it is by no means the  
11 only factor that affects market prices, as recognized by Bonbright as cited previously.<sup>90</sup>

12 As Professor Gordon noted, studies performed by Cragg and Malkiel<sup>91</sup> demonstrate  
13 that analysts' forecasts are superior to historical growth rate extrapolations. While some  
14 question the accuracy of analysts' forecasts of EPS growth, the level of accuracy of those  
15 analysts' forecasts well after the fact does not really matter for our purposes. What is  
16 important is that the forecasts reflect widely held expectations influencing investors at the  
17 time they make their pricing decisions, and hence, the market prices they pay.

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<sup>88</sup> Myron J. Gordon, "The Pricing of Common Stocks", Presented before the Spring 1990 Seminar, March 27, 1990 of the Institute for Quantitative Research in Finance, Palm Beach FL.

<sup>89</sup> *Ibid.* at 12.

<sup>90</sup> Bonbright, at 334.

<sup>91</sup> John G. Cragg and Burton G. Malkiel, Expectations and the Structure of Share Prices (University of Chicago Press 1982), Chapter 4.

1           Jeremy J. Siegel<sup>92</sup> also notes the importance of security analysts' EPS growth  
2 estimates to investors when he states:

3           For the equity holder, the source of future cash flows is the earnings of firms  
4 (p. 90)

5                               \* \* \*

6           Some people argue that shareholders most value stocks' cash dividends.  
7 But this is not necessarily true. (p. 91)

8                               \* \* \*

9           Since the price of a stock depends primarily on the present discounted value  
10 of all expected future dividends, it appears that dividend policy is crucial to  
11 determining the value of the stock. However, this is not generally true. (p.  
12 92)

13                              \* \* \*

14           Since stock prices are the present value of future dividends, it would seem  
15 natural to assume that economic growth would be an important factor  
16 influencing future dividends and hence stock prices. However, this is not  
17 necessarily so. The determinants of stock prices are earnings and dividends  
18 on a per-share basis. Although economic growth may influence aggregate  
19 earnings and dividends favorably, economic growth does not necessarily  
20 increase the growth of per-share earnings of dividends. It is earnings per  
21 share (EPS) that is important to Wall Street because per-share data, not  
22 aggregate earnings or dividends, are the basis of investor returns. (italics in  
23 original) (pp. 93-94)

24  
25           Moreover, there is no empirical evidence that investors would disregard analysts'  
26 estimates of growth in earnings per share. "Do Analyst Conflicts Matter? Evidence From  
27 Stock Recommendations"<sup>93</sup> by Anup Agrawal and Mark A. Chen examined whether

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<sup>92</sup> Jeremy J. Siegel, Stocks for the Long Run – The Definitive Guide to Financial Market Returns and Long-Term Investment Strategies (McGraw-Hill 2002), at 90-94.

<sup>93</sup> Anup Agrawal and Mark A. Chen, "Do Analysts' Conflicts Matter? Evidence from Stock Recommendations", Journal of Law and Economics (August 2008), Vol. 51, at 503-537.

1 conflicts of interest with investment banking (“IB”) and brokerage businesses induced sell-  
 2 side analysts to issue optimistic stock recommendations and whether investors were misled  
 3 by such biases when they state: “our findings do not support the view that conflicted  
 4 analysts are able to systematically mislead investors with optimistic stock  
 5 recommendations.” (page 503)

6 Agrawal and Chen explain:<sup>94</sup>

7 Overall, our empirical findings suggest that while analysts do respond to IB  
 8 and brokerage conflicts by inflating their stock recommendations, the  
 9 market discounts these recommendations after taking analysts’ conflicts  
 10 into account. These findings are reminiscent of the story of the nail soup  
 11 told by Brealey and Myers (1991), except that here analysts (rather than  
 12 accountants) are the ones who put the nail in the soup and investors (rather  
 13 than analysts) are the ones to take it out. Our finding that the market is not  
 14 fooled by biases stemming from conflicts of interest echoes similar findings  
 15 in the literature on conflicts of interest in universal banking (for example,  
 16 Kroszner and Rajan, 1994, 1997; Gompers and Lerner 1999) and on bias in  
 17 the financial media (for examples, Bhattacharya et al. forthcoming; Reuter  
 18 and Zitzewitz 2006). Finally, while we cannot rule out the possibility that  
 19 some investors may have been naïve, our findings do not support the notion  
 20 that the marginal investor was systematically misled over the last decade by  
 21 analysts’ recommendations. (page 531)

22 Therefore, given the overwhelming academic / empirical support regarding the  
 23 superiority of security analysts’ EPS growth rate forecasts, such EPS growth rate  
 24 projections should have been relied on by Mr. Rothschild in his DCF analysis.

25 **iii. Application of the Non-Constant Growth DCF Model**

26 **Q. PLEASE DESCRIBE MR. ROTHSCILD’S NON-CONSTANT DCF MODEL.**

27 A. Mr. Rothschild uses a simple cash flow model where an investor purchases stocks of each  
 28 proxy group company on 12/31/2019 and sells that stock on 12/31/2023. The income in

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<sup>94</sup> *Ibid.*

1 periods 2020 through 2022 are the interpolated projected dividends for each company from  
2 Value Line and the terminal value in 2023, which includes the projected dividend in 2023  
3 and the prospective price of the stock, and was calculated by multiplying the projected  
4 book value per share from Value Line by the M/B ratio.<sup>95</sup> After establishing the future  
5 cash flows, Mr. Rothschild performs an internal rate of return (“IRR”) calculation to derive  
6 an indicated ROE for each company. The IRR calculations result in indicated ROEs of  
7 5.72% and 6.96%.

8 **Q. DO YOU HAVE ANY CONCERNS REGARDING MR. ROTHSCCHILD’S NON-**  
9 **CONSTANT DCF MODEL?**

10 A. Yes. The major component of Mr. Rothschild’s non-constant growth DCF is the projected  
11 price at the end of the holding period. Mr. Rothschild’s prediction of future prices  
12 contradicts his citation of Warren Buffet on page 23 of his direct testimony in which Mr.  
13 Buffet advises investors that they “should not listen to a lot of the jabbering about what the  
14 market is going to do tomorrow, or next week, or next month, because nobody knows.” In  
15 this model, Mr. Rothschild predicts prices for each of his proxy group companies  
16 approximately four years in the future despite this advice from Mr. Buffet. Additionally,  
17 Mr. Rothschild’s calculation of expected sale price (projected book value multiplied by  
18 M/B ratio) is overly simplistic and does not consider other measures in Value Line that  
19 could also be used to calculate future prices (*i.e.* P/E ratio multiplied by projected EPS).

20 Regarding M/B ratios, it cannot be assumed that the M/B ratio for each company  
21 will stay constant over the hypothetical investor’s four-year holding period. As shown on

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<sup>95</sup> The M/B ratio used in Mr. Rothschild’s analyses were either the spot M/B ratio at 12/31/2019 or the “long-term” average for the years 2018 and 2019.



Chart 1, the M/B ratio of the proxy group has been increasing steadily for the past ten years and could be expected to continue to increase during the holding period. Alternatively, the M/B ratio could also regress to their long-term average M/B ratios. To explore these possibilities, I performed regression analyses on each company's historical M/B ratios to determine M/B ratios at the end of the holding period, and then applied those M/B ratios to the 2023 projected book value for each company for prospective prices. I also determined the long-term (ten-year) average M/B ratio for each company and applied those ratios to their prospective book value to determine another set of prospective prices. Table 5 contains the possible prices and resulting DCFs for each assumption of prospective market prices.

**Table 5: Possible Projected Market Prices and Associated ROEs Using Projected Book Value and M/B Ratios<sup>96</sup>**

Scenario	AWR	AWK	WTR	CWT	MSEX	YORW
Current M/B (Price)	\$105.77	\$147.96	\$55.84	\$56.73	\$71.92	\$53.65
Regression M/B (Price)	\$127.52	\$193.88	\$65.16	\$68.00	\$82.78	\$60.26
LT Avg M/B (Price)	\$55.65	\$83.85	\$51.57	\$37.07	\$40.09	\$35.29
Current M/B (ROE)	6.66%	6.58%	6.62%	4.16%	4.75%	5.56%
Regression M/B (ROE)	11.58%	13.73%	10.61%	8.79%	8.35%	8.55%
LT Avg M/B (ROE)	-8.46%	-6.81%	4.63%	-5.85%	-8.86%	-4.45%

As presented above, a wide range of prices and ROEs can be predicted by changing only one assumption. Also as indicated above, I calculated prospective prices and resultant

<sup>96</sup> Source of Information: Value Line Investment Survey and Bloomberg Professional Services.

ROEs from using P/E ratios and 2023 projected earnings per share from Value Line. I made three similar assumptions regarding the P/E ratios as I did with the prospective M/B ratios, specifically, staying constant, continuing on their current trend, or reverting to their long-term average throughout the holding period for each company. Table 6 contains the possible prices and resultant ROEs using P/E ratios and projected EPS in 2023:

**Table 6: Possible Projected Market Prices and Associated ROEs Using Projected EPS and P/E Ratios<sup>97</sup>**

Scenario	AWR	AWK	WTR	CWT	MSEX	YORW
Current P/E (Price)	\$112.75	\$156.51	\$71.80	\$62.00	\$77.18	\$66.81
Regression P/E (Price)	\$69.17	\$110.05	\$49.89	\$51.65	\$58.60	\$48.10
LT Avg P/E (Price)	\$72.99	\$114.70	\$50.39	\$54.10	\$60.16	\$49.52
Current P/E (ROE)	8.31%	8.03%	13.20%	6.40%	6.54%	11.29%
Regression P/E (ROE)	-3.64%	-0.66%	3.82%	1.85%	-0.27%	2.84%
LT Avg P/E (ROE)	-2.40%	-0.32%	4.06%	2.98%	0.35%	3.56%

Again, changing one assumption creates wide ranges of prices and resulting ROEs. This, in addition to the fact that the results of Mr. Rothschild's non-constant DCF create a real negative return on equity as explained above, shows that this model has no value.

### **C. Application of the CAPM**

**Q. PLEASE BRIEFLY DESCRIBE MR. ROTHSCILD'S CAPM ANALYSIS.**

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<sup>97</sup> *Ibid.*

1 A. Mr. Rothschild performs two CAPM analyses, one using a three-month Treasury bill and  
2 one using a 30-year Treasury Bond.<sup>98</sup> For his betas, he uses two types of option-implied  
3 betas. One beta is a “pure” forward beta, and one is a “hybrid” beta, which incorporates  
4 the weighting of forward and traditional historical betas. Option-implied betas are  
5 calculated based on option pricing of each proxy company and the S&P 500. Mr.  
6 Rothschild then applies the forward and hybrid betas to an 8.16% MRP to arrive at  
7 indicated CAPM cost rates of 8.02% (hybrid beta) and 9.68% (forward beta).<sup>99</sup>

8 **Q. DO YOU HAVE ANY CONCERNS WITH MR. ROTHSCCHILD’S APPLICATION**  
9 **OF THE CAPM?**

10 A. Yes. I have at least four concerns with Mr. Rothschild’s application of the CAPM: (1) Mr.  
11 Rothschild’s application of current and not forecasted interest rates; (2) the use of option-  
12 implied betas; (3) his prediction of future prices contradict his prior testimony; and (4) his  
13 failure to use the ECAPM. As I already discussed the applicability of concerns (1) and (4)  
14 previously, I will not repeat those discussions here. I will address concerns (2) and (3) in  
15 turn.

16 **Q. ARE OPTION-IMPLIED BETAS APPLICABLE TO MR. ROTHSCCHILD’S**  
17 **PROXY GROUP OR COST OF CAPITAL IN GENERAL?**

18 A. No. In the article used by Mr. Rothschild to derive his option-implied beta coefficients  
19 “*Option-Implied Measures of Equity Risk*”, the authors state:

---

<sup>98</sup> As Mr. Rothschild did not rely on his three-month Treasury bill CAPM for his recommendation, I will not directly address the applicability of short-term bills as a proxy for the risk-free rate, as I have already addressed using shorter-term Treasury instruments as a proxy for the risk-free rate during my critique of Mr. Parcell’s CAPM analysis.

<sup>99</sup> Mr. Rothschild’s MRP was calculated by estimating the future price of the S&P 500 and its dividend yield to determine a market return of 10.55% and then subtracting the current 30-year Treasury bond of 2.39%.

1 A key strength of our approach is that betas can be computed using closing  
 2 prices of options observed only on a single day. This may be an important  
 3 advantage when a company experiences major changes in its operating  
 4 environment or capital structure, in which case historical return data do not  
 5 constitute a reliable source for estimating betas. Examples include firms  
 6 involved in mergers and acquisitions, reorganized firms emerging from  
 7 Chapter 11, firms undertaking initial public offerings of seasoned equity  
 8 offerings, as well as firms undertaking large scale expansions and / or major  
 9 changes in the composition of debt and equity.<sup>100</sup>

10 As can be gleaned from the above, the advantage of option-implied betas are when  
 11 companies are undergoing fundamental change, which is hardly the case for Mr.  
 12 Rothschild's proxy group companies. Also, the authors state that option-implied betas  
 13 have relative difficulty when the ex-post (*i.e.*, historical) betas are far from unity and  
 14 performs better with higher beta stocks.<sup>101</sup> Mr. Rothschild's proxy group's average  
 15 unadjusted beta is just 0.49, which would be considered both far from unity and not a high  
 16 beta stock.

17 Third, the study was based on stocks that had liquid options and concluded that the  
 18 options-implied beta calculations will improve as options markets become more liquid.<sup>102</sup>  
 19 In reviewing Mr. Rothschild's workpapers, the average proxy group company had 13 call  
 20 options and nine put options traded throughout his option-implied beta calculation. These  
 21 option amounts compare to 556 call options and 1,853 put options for the S&P 500 proves  
 22 that the options market for Mr. Rothschild's proxy group is illiquid, which would call the  
 23 beta values calculated by Mr. Rothschild into question.

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<sup>100</sup> Bo-Young Chang, Peter Christoffersen, Kris Jacobs, and Gregory Vainberg, "Option-Implied Measures of Equity Risk", Review of Finance, March 1, 2011, at 386.

<sup>101</sup> *Ibid.*, at 417.

<sup>102</sup> *Ibid.*, at 410.

1 Fourth and finally, the authors do not endorse the use of option-implied betas as  
2 calculated by Mr. Rothschild for cost of capital purposes. The authors in their concluding  
3 remarks state:

4 The main focus in this paper has been on forecasting 180-day ex-post betas,  
5 which are relevant for certain applications such as abnormal returns. For  
6 other applications, *such as cost of capital applications*, longer horizon betas  
7 may be needed.<sup>103</sup>(italics added)

8 For the reasons stated above by the authors that Mr. Rothschild relied on in  
9 calculating his option-implied betas, the Commission should reject the use of option-  
10 implied betas for cost of capital purposes.

11 **Q. DO YOU HAVE CONCERNS REGARDING MR. ROTHSCCHILD'S**  
12 **CALCULATION OF THE MRP?**

13 A. Yes. Mr. Rothschild again eschews Mr. Buffet's advice and predicts the price and dividend  
14 of the S&P 500 a year from now. As demonstrated above concerning his non-constant  
15 DCF model, predicting a price for a certain stock much less an entire index is speculative  
16 at best and has no value.

17 **Q. IS THERE A CHECK ON MR. ROTHSCCHILD'S PREDICTED RETURN ON THE**  
18 **MARKET AND IMPLIED MRP TO GAUGE ITS REASONABLENESS?**

19 A. Yes. One can look to the recent past in both measures to see if his predictions are  
20 reasonable. A prospective market return of 10.55% and MRP of 8.16% compared to the  
21 ten-year average market return and MRP of 13.65% and 10.59%, respectively, show that  
22 Mr. Rothschild's predicted returns are unduly low given recent performance.

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<sup>103</sup> *Ibid.*, at 421.

**D. Adjustments to the Cost of Common Equity**

1 **Q. MR. ROTHSCHILD DEDUCTS 10 BASIS POINTS FROM HIS DCF RESULT FOR**  
2 **THE PERCEIVED DECREASED FINANCIAL RISK OF BGWC COMPARED**  
3 **WITH HIS PROXY GROUP. DO YOU AGREE WITH HIS ADJUSTMENT?**

4 A. No, I do not. As shown on Exhibit ALR 5, page 6, the average equity ratio of Mr.  
5 Rothschild's proxy group is 53.1%, which is nearly identical to BGWC's requested equity  
6 ratio of 52.91%. Mr. Rothschild's financial risk adjustment should be rejected by the  
7 Commission.

8 **Q. DOES MR. ROTHSCHILD MAKE A SPECIFIC ADJUSTMENT TO REFLECT**  
9 **BGWC'S INCREASED RISK RELATIVE TO THE PROXY GROUP BECAUSE**  
10 **OF ITS SMALLER SIZE?**

11 A. Yes. On page 7 of his direct testimony, Mr. Rothschild states:

12 My 8.75% cost of equity recommendation is above the average of my high-  
13 end results (8.47%) primarily because this Commission expressed concern  
14 in BGWC's 2017 rate case (Docket No. 2017-292-WS) regarding its size.  
15 In Order No. 2018-345(A), this Commission stated: "...there is no dispute  
16 that [BGWC] is significantly smaller than its proxy group counterparts, and  
17 therefore, it may present a higher risk."

18 The difference between his high-end result of 8.47% and 8.75% is 0.28%. This  
19 means Mr. Rothschild applied a 28-basis point upward adjustment to his indicated ROE,  
20 based on the proxy group, to account for the increased risk of BGWC's small size.

21 However, even though Mr. Rothschild applied an upward size adjustment to his  
22 indicated ROE in this proceeding, he continues to maintain that a size adjustment does not  
23 apply to utilities as stated in pages 71-72 of his direct testimony. This is another case of

1 Mr. Rothschild trying to create an issue where none exists,<sup>104</sup> and another example of Mr.  
2 Rothschild contradicting his own testimony.<sup>105</sup>

**E. Response to Mr. Rothschild's Criticisms of Company Testimony**

3 **Q. COULD YOU PLEASE SUMMARIZE MR. ROTHSCILD'S CRITICISMS OF**  
4 **YOUR DIRECT TESTIMONY?**

5 A. Mr. Rothschild disagrees with the following portions of my cost of capital analysis: (1) use  
6 of a non-regulated proxy group in determining my cost of common equity estimate; (2) use  
7 of expected growth in EPS in my DCF analysis; (3) my RPM results are too high because  
8 my expected market returns are unreasonable; (4) use of arithmetic averages in calculating  
9 expected risk premiums; and (5) application of a size adjustment to the proxy group  
10 indicated common equity cost rate to reflect BGWC's increased relative risk based on size.

11 Since I have addressed points 2 through 5 either in my comments on his testimony  
12 or in response to Mr. Parcell's direct testimony, I will not repeat those discussions here. I  
13 will address the remaining criticisms in turn.

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<sup>104</sup> For example, Mr. Rothschild's acceptance of my DCF as reasonable and continuing to critique my analysis.

<sup>105</sup> For example, Mr. Rothschild saying that nobody can predict the market from one day to the next and then putting forth predictions of future prices for his proxy group four years in the future and the market price and dividend yield one year into the future.

1 **Q. WHAT ARE THE CONCERNS MR. ROTHSCILD HAS WITH YOUR**  
2 **CONSIDERATION OF A NON-PRICE REGULATED PROXY GROUP IN YOUR**  
3 **ROE ANALYSES?**

4 A. Mr. Rothschild has the following concerns with my use of a non-price regulated proxy  
5 group in an ROE analysis: (1) non-price regulated companies have different risks than  
6 utility companies; (2) doubts concerning the calculation of the residual standard error and  
7 standard deviation of beta; (3) the range of acceptable unadjusted betas is too wide to be  
8 considered comparable risk; and (4) risks change over time and the non-price regulated  
9 proxy group is no longer comparable in risk. I have addressed concern (1) previously in  
10 this testimony and will not repeat that discussion here. I will respond to the rest of Mr.  
11 Rothschilds concerns in turn.

12 **Q. DID YOU RECEIVE ALL OF THE DATA USED TO SELECT YOUR NON-PRICE**  
13 **REGULATED PROXY GROUP DIRECTLY FROM VALUE LINE?**

14 A. Yes. I did. Mr. Rothschild's concern regarding the veracity of the calculations should be  
15 dismissed.

16 **Q. PLEASE ADDRESS MR. ROTHSCILD'S CONCERN REGARDING THE SIZE**  
17 **OF THE RANGE OF UNADJUSTED BETAS OF YOUR NON-PRICE**  
18 **REGULATED PROXY GROUP.**

19 A. The problem with Mr. Rothschild's observation is that he is only looking at one measure  
20 of the selection criteria. As stated previously in this testimony and in my direct testimony,  
21 beta measures market risk and the standard error of the regression is a measure of non-  
22 market risk, the sum of which equals total risk, as acknowledged in Mr. Rothschild's direct  
23 testimony on page 39. His concern should be dismissed.



1 **Q. MR. ROTHCHILD STATES THAT COMPANIES' RISKS AND BETAS**  
2 **CHANGE OVER TIME. DO YOU AGREE?**

3 A. Yes. My non-price regulated proxy group companies are selected at the time of my  
4 analyses (*i.e.* a snapshot of risk comparability) and the composition of my non-price  
5 regulated group does change as risk changes. Since the companies are of comparable total  
6 risk at the time of my analyses, what happens before or after the measurement period is  
7 irrelevant.

8 **VII. CONCLUSION**

9 **Q. WHAT ARE YOUR OVERALL CONCLUSIONS AND RECOMMENDATIONS?**

10 A. Based on the analyses discussed throughout my rebuttal testimony, I conclude that the  
11 Commission should authorize a WACC between 7.86% and 8.12% including a range of  
12 ROEs between 9.75% and 10.25%.

13 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

14 A. Yes, it does.

Blue Granite Water Company  
Recommended Capital Structure and Cost Rates  
for Ratemaking Purposes  
at June 30, 2019

<u>Type Of Capital</u>	<u>Ratios (1)</u>	<u>Cost Rate</u>	<u>Weighted Cost Rate</u>
Long-Term Debt	47.09%	5.73% (1)	2.70%
Common Equity	<u>52.91%</u>	9.75% - 10.25% (2)	<u>5.16%</u> - <u>5.42%</u>
Total	<u>100.00%</u>		<u>7.86%</u> <u>8.12%</u>

Notes:

(1) Company provided.

(2) From page 2 of this Schedule.

Blue Granite Water Company  
Brief Summary of Common Equity Cost Rate

<u>Line No.</u>	<u>Principal Methods</u>	<u>Proxy Group of Seven Water Companies</u>
1.	Discounted Cash Flow Model (DCF) (1)	8.91%
2.	Risk Premium Model (RPM) (2)	10.21%
3.	Capital Asset Pricing Model (CAPM) (3)	9.10%
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	<u>11.16%</u>
5.	Indicated Common Equity Cost Rate before Adjustment for Size Risk	9.75%
6.	Size Risk Adjustment (5)	0.50%
7.	Indicated Common Equity Cost Rate after Adjustment for Size Risk	<u><u>10.25%</u></u>
8.	Recommended Common Equity Cost Rate after Adjustment for Size Risk	<u><u>9.75% - 10.25%</u></u>

- Notes: (1) From page 3 of this Schedule.  
(2) From page 11 of this Schedule.  
(3) From page 23 of this Schedule.  
(4) From page 28 of this Schedule.  
(5) Business risk adjustment to reflect Blue Granite Water Company's greater business risk due to its unique risks as well as its small size relative to the proxy group as detailed in Mr. D'Ascendis' direct testimony.

Blue Granite Water Company  
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for  
Proxy Group of Seven Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Proxy Group of Seven Water Companies	Average Dividend Yield (1)	Value Line Projected Five Year Growth in EPS (2)	Zack's Five Year Projected Growth Rate in EPS (3)	Yahoo! Finance Projected Five Year Growth in EPS (4)	Average Projected Five Year Growth in EPS (3)	Adjusted Dividend Yield (4)	Indicated Common Equity Cost Rate (5)
American States Water Co.	1.40 %	8.00 %	8.00 %	6.00 %	7.33 %	1.45 %	8.78 %
American Water Works Company Inc	1.65	9.50	8.10	8.20	8.60	1.72	10.32
Artesian Resources Corporation	2.70	NA	NA	4.00	4.00	2.75	6.75
California Water Service Group	1.54	8.00	10.00	9.80	9.27	1.61	10.88
Middlesex Water Co.	1.64	7.50	NA	2.70	5.10	1.68	6.78
SJW Corp.	1.70	7.00	4.00	14.00	8.33	1.77	10.10
York Water Co.	1.62	9.50	NA	4.90	7.20	1.68	8.88
						Average	8.93 %
						Median	8.88 %
						Average of Mean and Median	8.91 %

NA= Not Available

Notes:

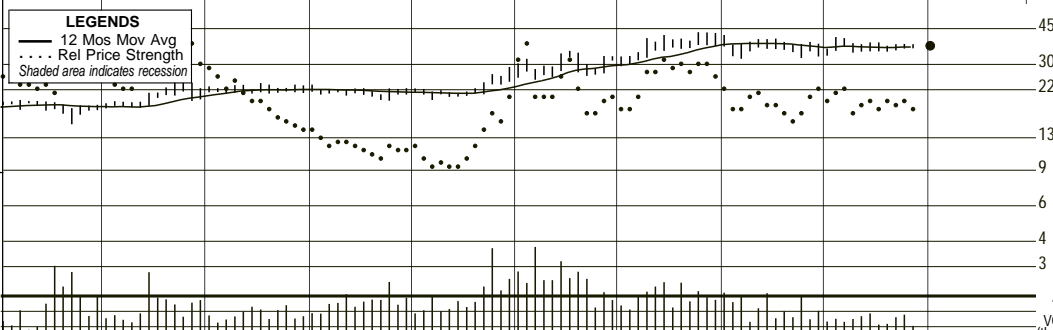
- (1) Indicated dividend at 01/17/2020 divided by the average closing price of the last 60 trading days ending 01/17/2020 for each company.
- (2) From pages 4 through 10 of this Schedule.
- (3) Average of columns 2 through 4 excluding negative growth rates.
- (4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 5) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Co.,  $1.40\% \times (1 + (1/2 \times 7.33\%)) = 1.45\%$ .
- (5) Column 5 + column 6.

Source of Information:

Value Line Investment Survey  
www.zacks.com Downloaded on 01/17/2020  
www.yahoo.com Downloaded on 01/17/2020

AMER. STATES WATER NYSE-AWR										RECENT PRICE	87.33	P/E RATIO	41.0	(Trailing: 39.7 Median: 21.0)	RELATIVE P/E RATIO	2.23	DIV'D YLD	1.4%	VALUE LINE	Target Price Range									
TIMELINESS	1	Raised 8/9/19	High: 21.0	19.4	19.8	18.2	24.1	33.1	38.7	44.1	47.2	58.4	69.6	96.0						2022	2023	2024							
SAFETY	2	Raised 7/20/12	Low: 13.5	14.9	15.6	15.3	17.0	24.0	27.0	35.8	37.3	41.1	50.1	63.3															
TECHNICAL	2	Lowered 12/20/19	LEGENDS 1.35 x Dividends p sh divided by Interest Rate ..... Relative Price Strength 2-for-1 split 9/13 Options: Yes Shaded area indicates recession																										
BETA	.65	(1.00 = Market)																											
18-Month Target Price Range																													
Low-High		Midpoint (% to Mid)																											
\$68-\$97		\$83 (-5%)																											
2022-24 PROJECTIONS																													
Price		Gain		Ann'l Total Return																									
High 75		55		(-15%)																									
Low 55				(-35%)																									
Institutional Decisions																													
1Q2019		2Q2019		3Q2019		Percent shares traded																							
to Buy 138		139		149		24																							
to Sell 105		109		124		16																							
Hld's(000)		26624		26893		8																							
© VALUE LINE PUB. LLC 22-24																													
2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020												
6.99	6.81	7.03	7.88	8.75	9.21	9.74	10.71	11.12	12.12	12.19	12.17	12.56	11.92	12.01	11.88	12.85	13.10	Revenues per sh 15.75											
1.04	1.11	1.32	1.45	1.65	1.69	1.70	2.11	2.13	2.48	2.65	2.67	2.81	2.70	2.96	2.84	3.10	3.25	"Cash Flow" per sh 4.00											
.39	.53	.66	.67	.81	.78	.81	1.11	1.12	1.41	1.61	1.57	1.61	1.62	1.88	1.72	2.15	2.20	Earnings per sh A 2.75											
.44	.44	.45	.46	.48	.50	.51	.52	.55	.64	.76	.83	.87	.91	.99	1.06	1.16	1.26	Div'd Decl'd per sh B 1.70											
1.88	2.51	2.12	1.95	1.45	2.23	2.09	2.12	2.13	1.77	2.52	1.89	2.39	3.55	3.08	3.44	3.95	3.50	Cap'l Spending per sh 3.25											
6.98	7.51	7.86	8.32	8.77	8.97	9.70	10.13	10.84	11.80	12.72	13.24	12.77	13.52	14.45	15.19	16.10	17.00	Book Value per sh D 19.35											
30.42	33.50	33.60	34.10	34.46	34.60	37.06	37.26	37.70	38.53	38.72	38.29	36.50	36.57	36.68	36.76	36.90	37.00	Common Shs Outs't'g C 37.50											
31.9	23.2	21.9	27.7	24.0	22.6	21.2	15.7	15.4	14.3	17.2	20.1	24.6	25.6	25.7	34.0			Avg Ann'l P/E Ratio 23.5											
1.82	1.23	1.17	1.50	1.27	1.36	1.41	1.00	.97	.91	.97	1.06	1.24	1.34	1.29	1.83			Relative P/E Ratio 1.30											
3.5%	3.6%	3.1%	2.5%	2.5%	2.9%	2.9%	3.0%	3.2%	3.1%	2.7%	2.6%	2.2%	2.2%	2.0%	1.8%			Avg Ann'l Div'd Yield 2.6%											
CAPITAL STRUCTURE as of 9/30/19						361.0	398.9	419.3	466.9	472.1	465.8	458.6	436.1	440.6	436.8		475	485	Revenues (\$mill) 590										
Total Debt \$475.3 mill. Due in 5 Yrs \$100.7 mill.						29.5	41.4	42.0	54.1	62.7	61.1	60.5	59.7	69.4	63.9		80.0	82.0	Net Profit (\$mill) 105										
LT Debt \$475.0 mill. LT Interest \$24.0 mill. (45% of Cap'l)						38.9%	43.2%	41.7%	39.9%	36.3%	38.4%	38.4%	36.0%	36.0%	22.0%		23.0%	23.0%	Income Tax Rate 23.0%										
Leases, Uncapitalized: Annual rentals \$2.6 mill.						3.2%	5.8%	2.0%	2.5%	--	--	--	--	2.5%	--		Nil	1.0%	AFUDC % to Net Profit 1.0%										
Pension Assets-12/18 \$162.5 mill.						45.9%	44.3%	45.4%	42.2%	39.8%	39.1%	41.1%	39.4%	38.0%	40.5%		44.0%	44.5%	Long-Term Debt Ratio 46.0%										
Oblig. \$196.1 mill.						54.1%	55.7%	54.6%	57.8%	60.2%	60.9%	58.9%	60.6%	62.0%	59.5%		56.0%	55.5%	Common Equity Ratio 54.0%										
Pfd Stock None						665.0	677.4	749.1	787.0	818.4	832.6	791.5	815.3	854.9	938.4		1070	1130	Total Capital (\$mill) 1350										
Common Stock 36,839,301 shs. as of 11/1/19						866.4	855.0	896.5	917.8	981.5	1003.5	1060.8	1150.9	1205.0	1296.3		1390	1475	Net Plant (\$mill) 1650										
						5.9%	7.6%	7.1%	8.3%	8.9%	8.6%	9.0%	8.6%	9.3%	7.9%		8.5%	8.5%	Return on Total Cap'l 9.0%										
						8.2%	11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%		13.5%	13.0%	Return on Shr. Equity 14.0%										
						8.2%	11.0%	10.3%	11.9%	12.7%	12.0%	13.0%	12.1%	13.1%	11.4%		13.5%	13.0%	Return on Com Equity 14.0%										
MARKET CAP: \$3.2 billion (Mid Cap)						3.2%	5.8%	5.3%	6.6%	6.8%	5.7%	6.0%	5.3%	6.2%	4.5%		6.0%	6.0%	Retained to Com Eq 5.5%										
CURRENT POSITION (MILL.)						61%	47%	49%	45%	47%	53%	54%	56%	52%	61%		54%	57%	All Div'ds to Net Prof 62%										
Cash Assets								2		7.1		10.4																	
Accts Receivable								26.1		23.4		28.1																	
Other								129.2		101.0		94.0																	
Current Assets								155.5		131.5		132.5																	
Accts Payable								51.0		59.5		59.8																	
Debt Due								59.3		40.3		.3																	
Other								46.4		46.8		59.7																	
Current Liab.								156.7		146.6		119.8																	
ANNUAL RATES of change (per sh)						Past 10 Yrs.	Past 5 Yrs.	Est'd '16-'18 to '22-'24																					
Revenues						3.5%	--	4.5%																					
"Cash Flow"						6.0%	3.0%	6.0%																					
Earnings						9.0%	4.5%	8.0%																					
Dividends						7.5%	9.0%	9.5%																					
Book Value						5.0%	4.0%	5.0%																					
Cal-endar	QUARTERLY REVENUES (\$ mill.)				Full Year																								
	Mar.31	Jun. 30	Sep. 30	Dec. 31																									
2016	93.5	112.0	123.8	106.8	436.1																								
2017	98.8	113.2	124.4	104.2	440.6																								
2018	94.7	106.9	124.2	111.0	436.8																								
2019	101.7	124.6	134.5	114.2	475																								
2020	105	125	140	115	485																								
Cal-endar	EARNINGS PER SHARE A				Full Year																								
	Mar.31	Jun. 30	Sep. 30	Dec. 31																									
2016	.28	.45	.59	.30	1.62																								
2017	.34	.62	.57	.35	1.88																								
2018	.29	.44	.62	.37	1.72																								
2019	.35	.72	.76	.32	2.15																								
2020	.38	.67	.70	.45	2.20																								
Cal-endar	QUARTERLY DIVIDENDS PAID B				Full Year																								
	Mar.31	Jun.30	Sep.30	Dec.31																									
2016	.224	.224	.224	.242	.91																								
2017	.242	.242	.255	.255	.99																								
2018	.255	.255	.275	.275	1.06																								
2019	.275	.275	.305	.305	1.16																								
2020																													
(A) Primary earnings. Excludes nonrecurring gains/(losses): '04, 7c; '05, 13c; '06, 3c; '08, 14c; '10, (23c); '11, 10c. Next earnings report due mid-February.						(B) Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.						(C) In millions, adjusted for split.						(D) Includes intangibles. As of 6/30/19; \$1.1 million/\$0.03 a share.						Company's Financial Strength A					
																								Stock's Price Stability 85					
																								Price Growth Persistence 95					
																								Earnings Predictability 90					
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AMERICAN WATER NYSE-AWK					RECENT PRICE	123.05	P/E RATIO	33.3	(Trailing: 35.1 Median: 19.0)	RELATIVE P/E RATIO	1.81	DIV'D YLD	1.7%	VALUE LINE					
TIMELINESS	1	Raised 4/5/19	High: 23.7	23.0	25.8	32.8	39.4	45.1	56.2	61.2	85.2	92.4	98.2	129.9	Target Price	Range			
SAFETY	3	New 7/25/08	Low: 16.5	16.2	19.4	25.2	31.3	37.0	41.1	48.4	58.9	70.0	76.0	88.0	2022	2023	2024		
TECHNICAL	3	Lowered 12/13/19	LEGENDS												200				
BETA	.55	(1.00 = Market)	1.10 x Dividends p.sh. divided by Interest Rate												160				
			Relative Price Strength												100				
			Options: Yes												80				
			Shaded area indicates recession												60				
															40				
															20				
18-Month Target Price Range																			
Low-High Midpoint (% to Mid)																			
\$105-\$146 \$126 (0%)																			
2022-24 PROJECTIONS																			
Price Gain Ann'l Total																			
High Low 120 80 (-35%) 2%																			
Low 80 (-35%) -7%																			
Institutional Decisions																			
1Q2019 2Q2019 3Q2019																			
to Buy 364 360 385																			
to Sell 325 331 322																			
Hld's(000) 155942 155051 153329																			
			Percent shares traded	21												% TOT. RETURN 11/19			
				14												THIS STOCK			
				7												VL ARITH. INDEX			
																1 yr. 29.1 6.5			
																3 yr. 77.2 24.6			
																5 yr. 153.0 38.9			
2003	2004	2005	2006E	2007E	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC	22-24
--	--	--	13.08	13.84	14.61	13.98	15.49	15.18	16.25	16.28	16.78	17.72	18.54	18.81	19.04	20.05	20.95	Revenues per sh	23.80
--	--	--	.65	d.47	2.87	2.89	3.56	3.73	4.27	4.36	4.75	5.13	5.26	5.14	6.15	6.75	7.10	"Cash Flow" per sh	8.30
--	--	--	d.97	d2.14	1.10	1.25	1.53	1.72	2.11	2.06	2.39	2.64	2.62	2.38	3.15	3.60	3.90	Earnings per sh <sup>A</sup>	4.70
--	--	--	--	--	.40	.82	.86	.90	1.21	.84	1.21	1.33	1.47	1.62	1.78	1.96	2.12	Div'd Decl'd per sh <sup>B</sup>	2.75
--	--	--	4.31	4.74	6.31	4.50	4.38	5.27	5.25	5.50	5.33	6.51	7.36	8.04	8.78	8.70	9.20	Cap'l Spending per sh	9.00
--	--	--	23.86	28.39	25.64	22.91	23.59	24.11	25.11	26.52	27.39	28.25	29.24	30.13	32.42	34.40	36.35	Book Value per sh <sup>D</sup>	41.25
--	--	--	160.00	160.00	160.00	174.63	175.00	175.66	176.99	178.25	179.46	178.28	178.10	178.44	180.68	181.00	182.00	Common Shs Outst'g <sup>C</sup>	189.00
--	--	--	--	--	18.9	15.6	14.6	16.8	16.7	19.9	20.0	20.5	27.7	33.8	27.3	Bold figures are		Avg Ann'l P/E Ratio	21.5
--	--	--	--	--	1.14	1.04	.93	1.05	1.06	1.12	1.05	1.03	1.45	1.70	1.47	Value Line		Relative P/E Ratio	1.20
--	--	--	--	--	1.9%	4.2%	3.8%	3.1%	3.4%	2.0%	2.5%	2.5%	2.0%	2.0%	2.1%	estimates		Avg Ann'l Div'd Yield	2.8%
CAPITAL STRUCTURE as of 9/30/19					2440.7	2710.7	2666.2	2876.9	2901.9	3011.3	3159.0	3302.0	3357.0	3440.0	3630	3810	Revenues (\$mill)	4500	
Total Debt \$9143.0 mil. Due in 5 Yrs \$1555.0 mil.					209.9	267.8	304.9	374.3	369.3	429.8	476.0	468.0	426.0	567.0	650	700	Net Profit (\$mill)	890	
LT Debt \$8640.0 mil. LT Interest \$370.0 mil. (59% of Cap'l)					37.9%	40.4%	39.5%	40.7%	39.1%	39.4%	39.1%	39.2%	53.3%	28.2%	21.0%	21.0%	Income Tax Rate	21.0%	
Leases, Uncapitalized: Annual rentals \$17.0 mil.					--	--	--	6.2%	5.1%	--	--	--	5.1%	4.0%	5.0%	5.0%	AFUDC % to Net Profit	5.0%	
Pension Assets 12/18 \$1499.0 mil.					56.9%	56.8%	55.7%	53.9%	52.4%	52.4%	53.7%	52.4%	54.7%	56.3%	58.0%	58.0%	Long-Term Debt Ratio	59.0%	
Oblig. \$1892.0 mil.					43.1%	43.2%	44.2%	46.1%	47.6%	47.4%	46.2%	47.5%	45.3%	43.6%	42.0%	42.0%	Common Equity Ratio	41.0%	
Pfd Stock \$7.0 mil. Pfd Div'd \$4 mil					9289.0	9561.3	9580.3	9635.5	9940.7	10364	10911	10967	11875	13433	14900	15700	Total Capital (\$mill)	18800	
Common Stock 180,776,169 shares as of 10/24/19					10524	11059	11021	11739	12391	12900	13933	14992	16246	17409	18350	19300	Net Plant (\$mill)	22500	
MARKET CAP: \$22.2 billion (Large Cap)					3.8%	4.4%	4.8%	5.4%	5.1%	5.5%	5.7%	5.6%	4.9%	5.4%	5.5%	5.5%	Return on Total Cap'l	6.0%	
CURRENT POSITION					5.2%	6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.5%	10.5%	Return on Shr. Equity	11.5%	
2017					5.2%	6.5%	7.2%	8.4%	7.8%	8.7%	9.4%	9.0%	7.9%	9.7%	10.5%	10.5%	Return on Com Equity	11.5%	
2018					1.8%	2.8%	3.5%	3.6%	4.7%	4.3%	4.7%	4.0%	2.5%	4.2%	5.0%	5.0%	Retained to Com Eq	5.0%	
2019					65%	56%	52%	57%	40%	50%	50%	56%	68%	56%	54%	54%	All Div'ds to Net Prof	59%	
2020					BUSINESS: American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to more than 14 million people in 46 states and Ontario, Canada. Nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up 87% of 2018 revenues. New Jersey is its largest market accounting for 24% of regulated revenues; Pennsylvania, 23%. Has 7,100 employees. The Vanguard Grp. owns 11.0% of outstanding shares; BlackRock, Inc., 7.9%; officers & directors, less than 1.0%. (3/19 Proxy). President & CEO: Susan N. Story. Chairman: George MacKenzie. Address: 1 Water Street, Camden, NJ 08102. Tel.: 856-346-8200. Internet: www.amwater.com.														
ANNUAL RATES of change (per sh)					next 10 years on expanding and improving its infrastructure. Relations with the different state regulators will remain very important as these authorities will decide what kind of return can be made on these investments. Based on the historical record, the regulatory climate should remain constructive.														
Past 10 Yrs.					The consolidation of the water industry is providing the company with plenty of opportunities. The U.S. water sector is composed of thousands of small, inefficient water districts that are mostly run by local municipalities. As more capital is required to upgrade antiquated pipelines and wastewater facilities, many of these districts are looking to be acquired by larger entities. American has been buying up some of these districts every year. Its bottom line benefits from this process because economies of scale are very achievable in this space.														
Past 5 Yrs.					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
Est'd '16-'18 to '22-'24					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
Revenues					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
"Cash Flow"					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
Earnings					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
Dividends					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
Book Value					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
Cal-endar					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
QUARTERLY REVENUES (\$ mill.)					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
Mar.31 Jun.30 Sep.30 Dec.31					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
2016					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
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Cal-endar					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
EARNINGS PER SHARE <sup>A</sup>					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
Mar.31 Jun.30 Sep.30 Dec.31					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
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Cal-endar					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
QUARTERLY DIVIDENDS PAID <sup>B</sup>					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
Mar.31 Jun.30 Sep.30 Dec.31					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
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2019					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
2020					The projected construction program is massive. At the company's recent Investor Day, management announced that it planned on spending about \$1.8 billion this year and about \$21 billion over the														
(A) Diluted earnings. Excludes nonrecr. losses: '08, \$4.62; '09, \$2.63; '11, \$0.07. Disc. oper.: '06, (\$0.04); '11, \$0.03; '12, (\$0.10); '13, (\$0.01). GAAP used as of 2014. Next earnings report due mid-February. Quarterly earnings do not sum in '16 due to rounding.					(C) In millions. (D) Includes intangibles. On 9/30/19: \$1.650 billion, \$9.13/share.														
(B) Dividends paid in March, June, September, and December. <sup>B</sup> Div. reinvestment available.					(E) Pro forma numbers for '06 & '07.														
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ARTESIAN RES. CORP. NDQ--ARTNA				RECENT PRICE	37.12	TRAILING P/E RATIO	23.2	RELATIVE P/E RATIO	1.27	DIV'D YLD	2.7%	VALUE LINE			
RANKS				19.99 15.16	24.43 18.20	24.27 21.52	23.82 19.85	29.16 20.00	35.00 25.17	43.22 29.37	41.92 32.00	40.97 33.14	High Low		
PERFORMANCE	2	Above Average		<div>LEGENDS</div> <div>— 12 Mos Mov Avg</div> <div>... Rel Price Strength</div> <div>Shaded area indicates recession</div> 											
Technical	2	Above Average													
SAFETY	3	Average													
BETA .65	(1.00 = Market)														
Financial Strength				B											
Price Stability				70											
Price Growth Persistence				55											
Earnings Predictability				85											
© VALUE LINE PUBLISHING LLC				2011	2012	2013	2014	2015	2016	2017	2018	2019	2020/2021		
SALES PER SH				7.56	8.10	7.82	8.13	8.50	8.67	8.92	8.69	--			
"CASH FLOW" PER SH				1.64	2.04	1.87	2.04	2.22	2.43	2.55	2.66	--			
EARNINGS PER SH				.83	1.13	.94	1.07	1.26	1.41	1.51	1.54	NA	NA/NA		
DIV'DS DECL'D PER SH				.76	.79	.82	.85	.87	.90	.93	.96	--			
CAP'L SPENDING PER SH				1.83	2.36	2.40	2.66	2.28	3.10	4.46	5.30	--			
BOOK VALUE PER SH				13.12	13.57	13.80	14.09	14.61	15.23	15.91	16.57	--			
COMMON SHS OUTST'G (MILL)				8.61	8.71	8.83	8.91	9.06	9.13	9.22	9.25	--			
AVG ANN'L P/E RATIO				22.5	18.3	23.9	20.5	18.0	20.9	24.2	23.9	NA	NA/NA		
RELATIVE P/E RATIO				1.41	1.17	1.34	1.08	.93	1.14	1.21	1.35	--			
AVG ANN'L DIV'D YIELD				4.1%	3.8%	3.7%	3.9%	3.8%	3.1%	2.5%	2.6%	--			
SALES (\$MILL)				65.1	70.6	69.1	72.5	77.0	79.1	82.2	80.4	--	Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.		
OPERATING MARGIN				45.5%	48.7%	47.0%	48.8%	43.0%	44.4%	44.6%	46.1%	--			
DEPRECIATION (\$MILL)				7.4	7.9	8.3	8.7	8.8	9.2	9.6	10.3	--			
NET PROFIT (\$MILL)				6.7	9.8	8.3	9.5	11.3	13.0	14.0	14.3	--			
INCOME TAX RATE				40.8%	40.2%	40.2%	40.1%	--	--	--	--	--			
NET PROFIT MARGIN				10.4%	14.0%	12.0%	13.1%	14.7%	16.4%	17.0%	17.8%	--			
WORKING CAP'L (\$MILL)				d11.4	d11.4	d12.3	d13.5	d8.8	d4.7	d9.5	d21.6	--			
LONG-TERM DEBT (\$MILL)				106.5	106.3	105.5	105.0	103.6	102.3	105.6	115.9	--			
SHR. EQUITY (\$MILL)				113.0	118.2	121.8	125.6	132.3	139.0	146.6	153.3	--			
RETURN ON TOTAL CAP'L				4.6%	5.9%	5.1%	5.5%	6.3%	6.7%	6.8%	6.5%	--			
RETURN ON SHR. EQUITY				6.0%	8.3%	6.8%	7.6%	8.5%	9.3%	9.5%	9.3%	--			
RETAINED TO COM EQ				.5%	2.5%	.9%	1.6%	2.6%	3.4%	3.7%	3.6%	--			
ALL DIV'DS TO NET PROF				92%	70%	87%	79%	69%	63%	61%	62%	--			
Note: No analyst estimates available.															
ANNUAL RATES				ASSETS (\$mill.)				INDUSTRY: Water Utility							
of change (per share)				5 Yrs.	1 Yr.	2017	2018	9/30/19	<b>BUSINESS:</b> Artesian Resources Corp. operates as the holding company of nine wholly-owned subsidiaries offering water, wastewater and other services in Delaware, Maryland and Pennsylvania. Artesian Water, its principal subsidiary, distributes and sells water to residential, commercial, industrial, governmental, municipal, and utility customers throughout Delaware. In addition, Artesian Water provides services to other water utilities, including operations and billing functions, and has contract operation agreements with private and municipal water providers. It also provides water for public and private fire protection to customers in service territories. Artesian supplies 7.9 billion gallons of water per year through 1,311 miles of main to nearly a third of Delaware residents. Artesian Wastewater Management, Inc. is a regulated entity that owns wastewater collection and treatment infrastructure and provides wastewater services to customers in Delaware. Has 241 employees. Chairman, C.E.O. & President: Dian C. Taylor Address: 664 Churchmans Rd., Newark, DE 19702. Tel.: (302) 453-6900. Internet: www.artesianresources.com.  E.B.  January 10, 2020						
Sales				2.5%	-2.5%	1.0	.3	.5							
"Cash Flow"				6.5%	4.0%	8.9	8.2	6.8							
Earnings				9.0%	2.0%	1.5	1.5	1.3							
Dividends				3.0%	3.0%	7.6	6.1	6.3							
Book Value				3.5%	4.0%	19.0	16.1	14.9							
Fiscal Year	QUARTERLY SALES (\$mill.)				LIABILITIES (\$mill.)				<b>LONG-TERM DEBT AND EQUITY as of 9/30/19</b>  Total Debt \$147.9 mill. Due in 5 Yrs. NA LT Debt \$114.6 mill. Including Cap. Leases NA (42% of Cap'l) Leases, Uncapitalized Annual rentals NA  Pension Liability None in '18 vs. None in '17  Pfd Stock None Pfd Div'd Paid None Common Stock 9,285,325 shares (58% of Cap'l)						
	1Q	2Q	3Q	4Q	Full Year										
12/31/17	19.2	20.5	22.3	20.2	82.2	Property, Plant & Equip, at cost	582.0	629.4							--
12/31/18	18.9	20.2	21.9	19.4	80.4	Accum Depreciation	117.6	126.9							--
12/31/19	19.4	20.7	22.5			Net Property	464.4	502.5							522.5
12/31/20						Other	11.2	11.2							11.5
						Total Assets	494.6	529.8	548.9						
Fiscal Year	EARNINGS PER SHARE				Full Year				<b>TOTAL SHAREHOLDER RETURN</b> Dividends plus appreciation as of 11/30/2019						
	1Q	2Q	3Q	4Q											
12/31/16	.30	.33	.48	.30	1.41	Accts Payable	9.2	8.3							5.0
12/31/17	.34	.35	.42	.40	1.51	Debt Due	11.0	17.7							33.4
12/31/18	.38	.42	.42	.32	1.54	Other	8.3	11.7							11.8
12/31/19	.39	.41	.48			Current Liab	28.5	37.7							50.2
12/31/20															
Cal-endar	QUARTERLY DIVIDENDS PAID				Full Year				2.89% 5.89% 5.10% 27.76% 101.05%						
	1Q	2Q	3Q	4Q											
2017	.228	.232	.232	.235	.93										
2018	.235	.239	.239	.242	.96										
2019	.242	.246	.246	.25	.98										
2020															
INSTITUTIONAL DECISIONS				TOTAL SHAREHOLDER RETURN											
1Q'19 2Q'19 3Q'19				3 Mos. 6 Mos. 1 Yr. 3 Yrs. 5 Yrs.											
to Buy 39 38 38				2.89% 5.89% 5.10% 27.76% 101.05%											
to Sell 32 35 28															
Hld's(000) 3896 3949 3995															

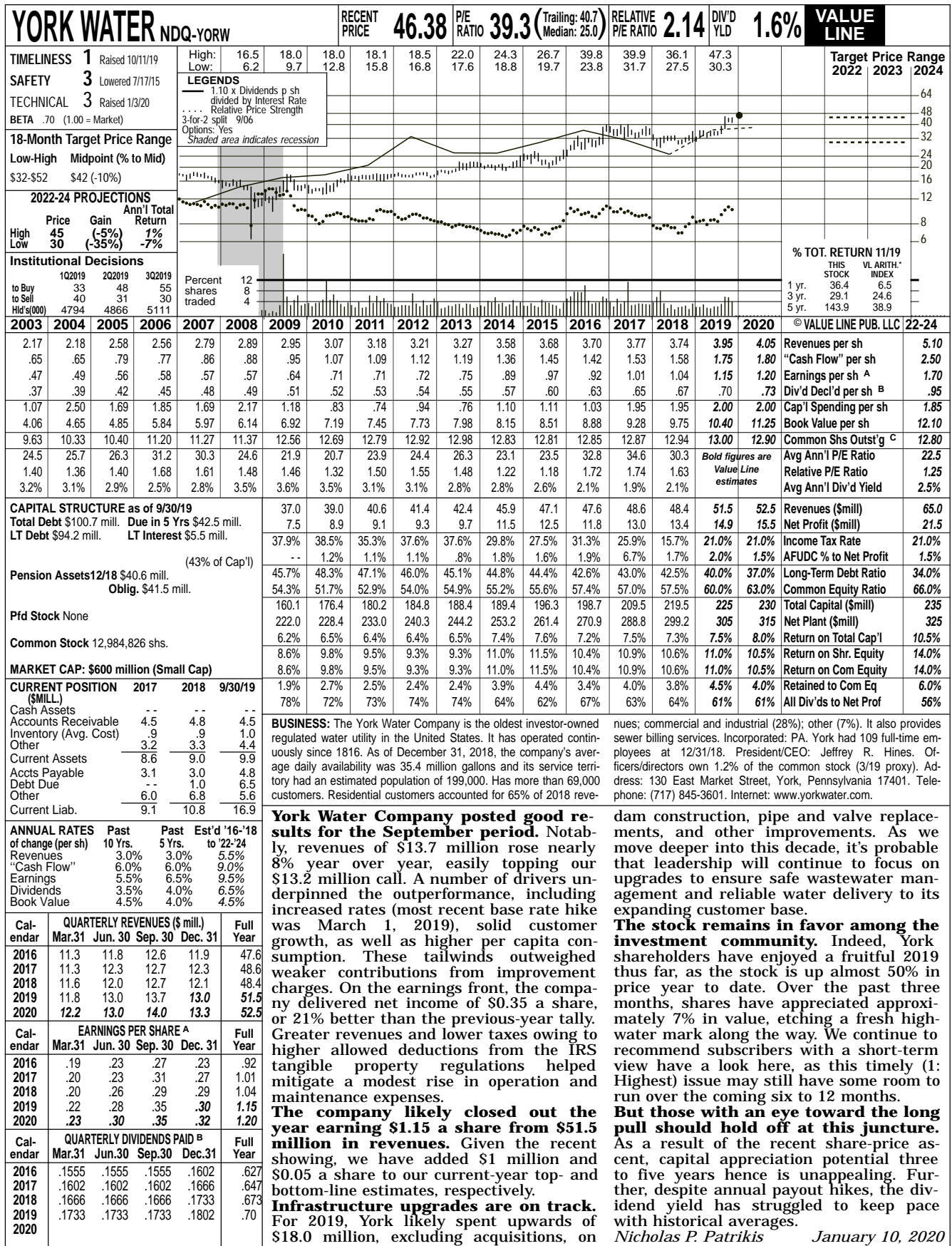


<p>(A) Basic EPS. Excl. nonrecurring gain (loss): '11, 4c. Next earnings report due early Feb.</p> <p>(B) Dividends historically paid in late Feb., May, Aug., and Nov. ■ Div'd reinvestment plan</p>	<p>available.</p> <p>(C) Incl. intangible assets. In '18 : \$24.7 mill., \$0.51/sh.</p> <p>(D) In millions, adjusted for splits.</p>	<p>(E) Excludes non-reg. rev.</p>	<p><b>Company's Financial Strength</b> B++</p> <p><b>Stock's Price Stability</b> 80</p> <p><b>Price Growth Persistence</b> 60</p> <p><b>Earnings Predictability</b> 65</p>
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MIDDLESEX WATER NDQ-MSEX				RECENT PRICE	63.56	P/E RATIO	31.5 (Trailing: 32.3 Median: 21.0)	RELATIVE P/E RATIO	1.71	DIV'D YLD	1.6%	VALUE LINE							
TIMELINESS 3 Lowered 5/24/19	SAFETY 2 New 10/21/11	TECHNICAL 2 Raised 1/3/20	BETA .75 (1.00 = Market)	High: 19.8 Low: 12.0	17.9 11.6	19.3 14.7	19.4 16.5	19.6 17.5	22.5 18.6	23.7 19.1	28.0 21.2	44.5 25.0	46.7 32.2	60.3 34.0	67.7 51.0	Target Price Range 2022 2023 2024			
18-Month Target Price Range				LEGENDS 1.20 x Dividends p sh divided by Interest Rate ..... Relative Price Strength Options: Yes Shaded area indicates recession															
Low-High Midpoint (% to Mid)																			
\$52-\$89 \$71 (10%)																			
2022-24 PROJECTIONS																			
Price Gain Ann'l Total High Low 60 45 (-5%) Nil Low 45 (-30%) -6%																			
Institutional Decisions																			
to Buy 1Q2019 2Q2019 3Q2019 to Sell 72 79 56 Hld's(000) 67 58 67 9424 9432 9915				Percent shares traded 12 8 4															
2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	© VALUE LINE PUB. LLC 22-24	
6.12	6.25	6.44	6.16	6.50	6.79	6.75	6.60	6.50	6.98	7.19	7.26	7.77	8.16	8.00	8.42	7.70	8.20	Revenues per sh	9.15
1.15	1.28	1.33	1.33	1.49	1.53	1.40	1.55	1.46	1.56	1.72	1.84	1.97	2.17	2.24	2.89	2.80	2.95	"Cash Flow" per sh	3.45
.61	.73	.71	.82	.87	.89	.72	.96	.84	.90	1.03	1.13	1.22	1.38	1.38	1.96	1.95	2.10	Earnings per sh A	2.45
.65	.66	.67	.68	.69	.70	.71	.72	.73	.74	.75	.76	.78	.81	.86	.91	.98	1.04	Div'd Decl'd per sh B	1.15
1.87	2.54	2.18	2.31	1.66	2.12	1.49	1.90	1.50	1.36	1.26	1.40	1.59	2.91	3.08	4.40	3.50	3.50	Cap'l Spending per sh	3.50
7.60	8.02	8.26	9.52	10.05	10.03	10.33	11.13	11.27	11.48	11.82	12.24	12.74	13.40	14.02	15.17	15.70	16.15	Book Value per sh	17.05
10.48	11.36	11.58	13.17	13.25	13.40	13.52	15.57	15.70	15.82	15.96	16.12	16.23	16.30	16.35	16.40	17.50	17.65	Common Shs Outst'g C	18.00
30.0	26.4	27.4	22.7	21.6	19.8	21.0	17.8	21.7	20.8	19.7	18.5	19.1	25.6	28.4	22.2	Bold figures are Value Line estimates	21.0	Avg Ann'l P/E Ratio	21.0
1.71	1.39	1.46	1.23	1.15	1.19	1.40	1.13	1.36	1.32	1.11	.97	.96	1.34	1.43	1.20	1.20	1.15	Relative P/E Ratio	1.15
3.5%	3.4%	3.5%	3.7%	3.7%	4.0%	4.7%	4.2%	4.0%	4.0%	3.7%	3.7%	3.3%	2.3%	2.2%	2.1%	2.1%	2.2%	Avg Ann'l Div'd Yield	2.2%
CAPITAL STRUCTURE as of 9/30/19																			
Total Debt \$294.0 mill. Due in 5 Yrs \$65.7 mill.																			
LT Debt \$228.3 mill. LT Interest \$6.8 mill.																			
(Total interest coverage: 8.5x) (45% of Cap'l)																			
Pension Assets-12/18 \$66.8 mill.																			
Oblig. \$83.9 mill.																			
Pfd Stock \$2.4 mill. Pfd Div'd: \$.1 mill.																			
Common Stock 16,669,540 shs. as of 10/31/19																			
MARKET CAP: \$1.1 billion (Mid-Cap)																			
CURRENT POSITION 2017 2018 9/30/19 (\$MILL.)																			
Cash Assets 4.9 3.7 3.2																			
Other 24.3 27.1 31.5																			
Current Assets 29.2 30.8 34.7																			
Accts Payable 13.9 19.3 20.2																			
Debt Due 34.9 55.8 65.7																			
Other 15.7 19.3 17.6																			
Current Liab. 64.5 94.4 103.5																			
ANNUAL RATES Past Past Est'd '16-'18 of change (per sh) 10 Yrs. 5 Yrs. to '22-'24																			
Revenues 2.5% 3.5% 2.0%																			
"Cash Flow" 5.5% 9.0% 6.5%																			
Earnings 6.0% 11.0% 7.5%																			
Dividends 2.0% 3.0% 5.0%																			
Book Value 3.5% 4.5% 3.0%																			
Cal-endar	QUARTERLY REVENUES (\$ mill.) Full Year																		
	Mar.31	Jun. 30	Sep. 30	Dec. 31															
2016	30.6	32.7	37.8	31.8	132.9														
2017	30.1	33.0	36.2	31.5	130.8														
2018	31.2	34.9	38.7	33.3	138.1														
2019	30.7	33.4	37.8	33.1	135														
2020	32.0	36.0	42.0	35.0	145														
Cal-endar	EARNINGS PER SHARE A Full Year																		
	Mar.31	Jun. 30	Sep. 30	Dec. 31															
2016	.29	.36	.54	.19	1.38														
2017	.27	.33	.46	.32	1.38														
2018	.27	.52	.74	.43	1.96														
2019	.39	.49	.66	.41	1.95														
2020	.40	.55	.70	.45	2.10														
Cal-endar	QUARTERLY DIVIDENDS PAID B Full Year																		
	Mar.31	Jun. 30	Sep. 30	Dec. 31															
2016	.19875	.19875	.19875	.21125	.81														
2017	.21125	.21125	.21125	.22375	.86														
2018	.22375	.22375	.22375	.24	.91														
2019	.24	.24	.24	.2562	.98														
2020																			
(A) Diluted earnings. Next earnings report due late January.				(B) Dividends historically paid in mid-Feb., May, Aug., and November. Div'd reinvestment plan available.				(C) In millions.				Company's Financial Strength B++				Stock's Price Stability 65			
												Price Growth Persistence 55				Earnings Predictability 75			
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(A) Diluted earnings. Next earnings report due late January.  
(B) Dividends historically paid in late February, June, September, and December.

(C) In millions, adjusted for split.

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Company's Financial Strength B+  
Stock's Price Stability 60  
Price Growth Persistence 70  
Earnings Predictability 95

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Blue Granite Water Company  
Summary of Risk Premium Models for the  
Proxy Group of Seven Water Companies

	<u>Proxy Group of Seven Water Companies</u>
Predictive Risk Premium Model (PRPM) (1)	11.08 %
Risk Premium Using an Adjusted Total Market Approach (2)	<u>9.34 %</u>
Average	<u><u>10.21 %</u></u>

Notes:

- (1) From page 12 of this Schedule.
- (2) From page 13 of this Schedule.



Blue Granite Water Company  
Indicated ROE  
Derived by the Predictive Risk Premium Model (1)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Proxy Group of Seven Water Companies	LT Average Predicted Variance	Spot Predicted Variance	Recommended Variance (2)	GARCH Coefficient	Predicted Risk Premium (3)	Risk-Free Rate (4)	Indicated ROE (5)
American States Water Co.	0.38%	0.44%	0.41%	1.95005	10.02%	2.70%	12.72%
American Water Works Company Inc	NMF	NMF	NMF	6.14998	NMF	2.70%	NMF
Artesian Resources Corporation	0.32%	0.22%	0.27%	2.11719	7.11%	2.70%	9.81%
California Water Service Group	0.32%	0.34%	0.33%	1.99359	8.20%	2.70%	10.90%
Middlesex Water Co.	0.30%	0.28%	0.29%	2.17112	7.80%	2.70%	10.50%
SJW Corp.	0.42%	0.35%	0.38%	1.60932	7.62%	2.70%	10.32%
York Water Co.	0.45%	0.37%	0.41%	2.26766	11.76%	2.70%	14.46%
						Average	11.45%
						Median	10.70%
						Average of Mean and Median	11.08%

NMF = Not Meaningful Figure

Notes:

- (1) The Predictive Risk Premium Model uses historical data to generate a predicted variance and a GARCH coefficient. The historical data used are the equity risk premiums for the first available trading month as reported by Bloomberg Professional Service.
- (2) Average of Columns [1] and [2].
- (3)  $(1 + (\text{Column [3]} * \text{Column [4]})^{12}) - 1$ .
- (4) From note 2 on page 24 of this Schedule.
- (5) Column [5] + Column [6].

Blue Granite Water Company  
Indicated Common Equity Cost Rate  
Through Use of a Risk Premium Model  
Using an Adjusted Total Market Approach

<u>Line No.</u>		<u>Proxy Group of Seven Water Companies</u>
1.	Prospective Yield on Aaa Rated Corporate Bonds (1)	3.68 %
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A Rated Public Utility Bonds	<u>0.37</u> (2)
3.	Adjusted Prospective Yield on A Rated Public Utility Bonds	4.05 %
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	<u>0.06</u> (3)
5.	Adjusted Prospective Bond Yield	4.11 %
6.	Equity Risk Premium (4)	<u>5.23</u>
7.	Risk Premium Derived Common Equity Cost Rate	<u><u>9.34</u></u> %

- Notes:
- (1) Consensus forecast of Moody's Aaa Rated Corporate bonds from Blue Chip Financial Forecasts (see pages 20-21 of this Schedule).
  - (2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.37% from page 14 of this Schedule.
  - (3) Adjustment to reflect the A2 / A3 Moody's LT issuer rating of the Utility Proxy Group as shown on page 15 of this Schedule. The 0.06% upward adjustment is derived by taking 1/6 of the spread between A2 and Baa2 Public Utility Bonds ( $1/6 * 0.34\% = 0.06\%$ ) as derived from page 14 of this Schedule.
  - (4) From page 17 of this Schedule.

Blue Granite Water Company  
Interest Rates and Bond Spreads for  
Moody's Corporate and Public Utility Bonds

Selected Bond Yields

	[1]	[2]	[3]
	<u>Aaa Rated Corporate Bond</u>	<u>A Rated Public Utility Bond</u>	<u>Baa Rated Public Utility Bond</u>
Dec-2019	3.01 %	3.40 %	3.73 %
Nov-2019	3.06	3.42	3.76
Oct-2019	<u>3.01</u>	<u>3.39</u>	<u>3.72</u>
Average	<u><u>3.03 %</u></u>	<u><u>3.40 %</u></u>	<u><u>3.74 %</u></u>

Selected Bond Spreads

A Rated Public Utility Bonds Over Aaa Rated Corporate Bonds:

0.37 % (1)

Baa Rated Public Utility Bonds Over A Rated Public Utility Bonds:

0.34 % (2)

Notes:

(1) Column [2] - Column [1].

(2) Column [3] - Column [2].

Source of Information:

Bloomberg Professional Service

Blue Granite Water Company  
Comparison of Long-Term Issuer Ratings for  
Proxy Group of Seven Water Companies

	Moody's		Standard & Poor's	
	Long-Term Issuer Rating		Long-Term Issuer Rating	
	January 2020		January 2020	
<u>Proxy Group of Seven Water Companies</u>	Long-Term Issuer Rating	Numerical Weighting (1)	Long-Term Issuer Rating	Numerical Weighting(1)
American States Water Co. (2)	A2	6.0	A+	5.0
American Water Works Company Inc (3)	A3	7.0	A	6.0
Artesian Resources Corporation	NR	--	NR	--
California Water Service Group (4)	NR	--	A+	5.0
Middlesex Water Co.	NR	--	A	6.0
SJW Corp. (5)	NR	--	A/A-	6.5
York Water Co.	NR	--	A-	7.0
Average	<u>A2 / A3</u>	<u>6.5</u>	<u>A</u>	<u>5.9</u>

Notes:

- (1) From page 16 of this Schedule.
- (2) Ratings that of Golden State Water Company.
- (3) Ratings that of New Jersey and Pennsylvania American Water Companies.
- (4) Ratings that of California Water Service Company.
- (5) Ratings that of San Jose Water Co. and The Connecticut Water Co.

Source Information: Moody's Investors Service  
Standard & Poor's Global Utilities Rating Service



Numerical Assignment for  
Moody's and Standard & Poor's Bond Ratings

Moody's Bond Rating	Numerical Bond Weighting	Standard & Poor's Bond Rating
Aaa	1	AAA
Aa1	2	AA+
Aa2	3	AA
Aa3	4	AA-
A1	5	A+
A2	6	A
A3	7	A-
Baa1	8	BBB+
Baa2	9	BBB
Baa3	10	BBB-
Ba1	11	BB+
Ba2	12	BB
Ba3	13	BB-
B1	14	B+
B2	15	B
B3	16	B-

Blue Granite Water Company  
Judgment of Equity Risk Premium for  
Proxy Group of Seven Water Companies

<u>Line No.</u>		<u>Proxy Group of Seven Water Companies</u>
1.	Calculated equity risk premium based on the total market using the beta approach (1)	5.34 %
2.	Mean equity risk premium based on a study using the holding period returns of public utilities with A rated bonds (2)	<u>5.11</u>
3.	Average equity risk premium	<u><u>5.23 %</u></u>

Notes: (1) From page 18 of this Schedule.  
(2) From page 22 of this Schedule.

Blue Granite Water Company  
Derivation of Equity Risk Premium Based on the Total Market Approach  
Using the Beta for the  
Proxy Group of Seven Water Companies

<u>Line No.</u>	<u>Equity Risk Premium Measure</u>	<u>Proxy Group of Seven Water Companies</u>
<u>Ibbotson-Based Equity Risk Premiums:</u>		
1.	Ibbotson Equity Risk Premium (1)	5.54 %
2.	Regression on Ibbotson Risk Premium Data (2)	8.61
3.	Ibbotson Equity Risk Premium based on PRPM (3)	7.38
4.	Equity Risk Premium Based on Value Line Summary and Index (4)	8.40
5.	Equity Risk Premium Based on Value Line S&P 500 Companies (5)	10.85
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	<u>10.05</u>
7.	Conclusion of Equity Risk Premium	8.47 %
8.	Adjusted Beta (7)	<u>0.63</u>
9.	Forecasted Equity Risk Premium	<u><u>5.34 %</u></u>

Notes provided on page 19 of this Schedule.

Blue Granite Water Company  
Derivation of Equity Risk Premium Based on the Total Market Approach  
Using the Beta for the  
Proxy Group of Seven Water Companies

Notes:

- (1) Based on the arithmetic mean historical monthly returns on large company common stocks from Ibbotson® SBBI® 2019 Market Report minus the arithmetic mean monthly yield of Moody's average Aaa and Aa corporate bonds from 1926-2018.
- (2) This equity risk premium is based on a regression of the monthly equity risk premiums of large company common stocks relative to Moody's average Aaa and Aa rated corporate bond yields from 1928-2018 referenced in Note 1 above.
- (3) The Predictive Risk Premium Model (PRPM) is discussed in the accompanying direct testimony. The Ibbotson equity risk premium based on the PRPM is derived by applying the PRPM to the monthly risk premiums between Ibbotson large company common stock monthly returns and average Aaa and Aa corporate monthly bond yields, from January 1928 through December 2019.
- (4) The equity risk premium based on the Value Line Summary and Index is derived by subtracting the average consensus forecast of Aaa corporate bonds of 3.68% (from page 13 of this Schedule) from the projected 3-5 year total annual market return of 12.08% (described fully in note 1 on page 24 of this Schedule).
- (5) Using data from Value Line for the S&P 500, an expected total return of 14.53% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.68% results in an expected equity risk premium of 10.85%.
- (6) Using data from the Bloomberg Professional Service for the S&P 500, an expected total return of 13.73% was derived based upon expected dividend yields and long-term earnings growth estimates as a proxy for capital appreciation. Subtracting the average consensus forecast of Aaa corporate bonds of 3.68% results in an expected equity risk premium of 10.05%.
- (7) Average of mean and median beta from page 23 of this Schedule.

Sources of Information:

Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.  
Industrial Manual and Mergent Bond Record Monthly Update.  
Value Line Summary and Index  
Blue Chip Financial Forecasts, January 1, 2020 and December 1, 2019  
Bloomberg Professional Service

2 ■ BLUE CHIP FINANCIAL FORECASTS ■ JANUARY 1, 2020

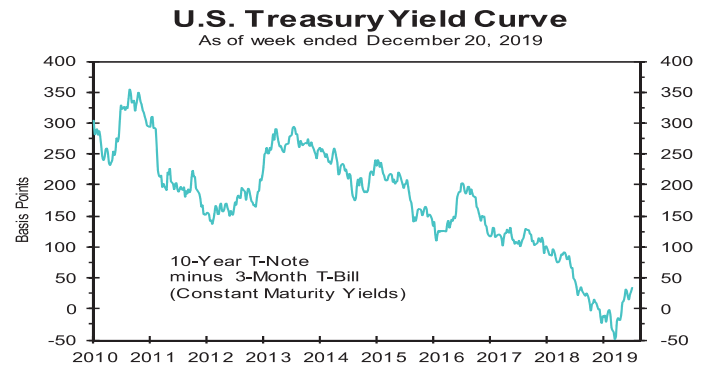
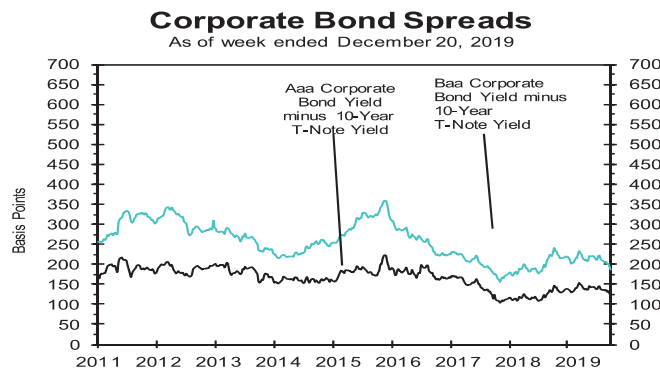
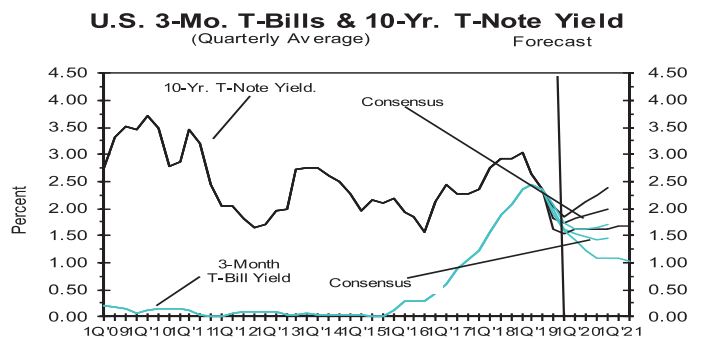
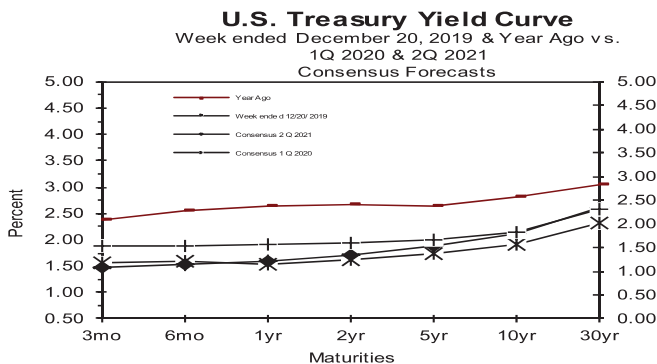
## Consensus Forecasts of U.S. Interest Rates and Key Assumptions

Interest Rates	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			Latest Qtr	1Q 2020		2Q 2020		3Q 2020	
	Dec 20	Dec 13	Dec 6	Nov 29	Nov	Oct	Sep	4Q 2019*	2020	2020	2020	2020	2021	2021
Federal Funds Rate	1.55	1.55	1.56	1.55	1.55	1.83	2.04	1.66	1.6	1.5	1.5	1.4	1.5	1.5
Prime Rate	4.75	4.75	4.75	4.75	4.75	4.99	5.15	4.84	4.7	4.7	4.6	4.6	4.6	4.6
LIBOR, 3-mo.	1.91	1.89	1.89	1.91	1.90	1.98	2.13	1.93	1.9	1.8	1.7	1.8	1.7	1.8
Commercial Paper, 1-mo.	1.64	1.61	1.63	1.58	1.62	1.86	2.01	1.72	1.7	1.6	1.6	1.6	1.6	1.6
Treasury bill, 3-mo.	1.57	1.56	1.56	1.61	1.57	1.68	1.93	1.61	1.5	1.5	1.4	1.4	1.5	1.5
Treasury bill, 6-mo.	1.58	1.57	1.57	1.62	1.59	1.67	1.89	1.61	1.6	1.5	1.5	1.5	1.5	1.5
Treasury bill, 1 yr.	1.53	1.55	1.57	1.59	1.57	1.61	1.80	1.58	1.6	1.6	1.5	1.6	1.6	1.6
Treasury note, 2 yr.	1.63	1.63	1.58	1.61	1.61	1.55	1.65	1.59	1.6	1.6	1.6	1.6	1.7	1.7
Treasury note, 5 yr.	1.73	1.68	1.62	1.61	1.64	1.53	1.57	1.61	1.7	1.7	1.7	1.8	1.8	1.9
Treasury note, 10 yr.	1.91	1.84	1.79	1.76	1.81	1.71	1.70	1.78	1.8	1.9	1.9	2.0	2.1	2.1
Treasury note, 30 yr.	2.33	2.27	2.24	2.20	2.28	2.19	2.16	2.25	2.3	2.4	2.4	2.5	2.5	2.6
Corporate Aaa bond	3.13	3.11	3.12	3.07	3.16	3.11	3.10	3.13	3.2	3.3	3.4	3.5	3.5	3.6
Corporate Baa bond	3.78	3.77	3.81	3.77	3.86	3.86	3.84	3.84	4.1	4.2	4.3	4.4	4.5	4.5
State & Local bonds	3.10	3.10	3.12	3.10	3.15	3.14	3.15	3.13	2.9	3.0	3.1	3.1	3.2	3.2
Home mortgage rate	3.73	3.73	3.68	3.68	3.70	3.69	3.61	3.70	3.7	3.8	3.8	3.9	4.0	4.0

Key Assumptions	History								Consensus Forecasts-Quarterly					
	1Q 2018		2Q 2018		3Q 2018		4Q 2018		1Q 2020		2Q 2020		3Q 2020	
	2018	2018	2018	2018	2018	2018	2018	2018	2020	2020	2020	2020	2021	2021
Fed's AFE \$ Index	102.9	105.5	107.8	109.4	109.4	110.3	110.5	110.4	109.6	109.1	108.8	108.4	108.3	108.1
Real GDP	2.5	3.5	2.9	1.1	3.1	2.0	2.1	1.8	1.6	1.8	1.8	1.9	1.9	2.0
GDP Price Index	2.3	3.2	2.0	1.6	1.1	2.4	1.8	1.8	1.9	2.0	2.0	2.0	2.0	2.0
Consumer Price Index	3.2	2.1	2.0	1.5	0.9	2.9	1.8	2.3	2.1	2.0	2.1	2.0	2.1	2.0

Forecasts for interest rates and the Federal Reserve's Major Currency Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index and Consumer Price Index are seasonally-adjusted annual rates of change (saar). Individual panel members' forecasts are on pages 4 through 9. Historical data: Treasury rates from the Federal Reserve Board's H.15; AAA-AA and A-BBB corporate bond yields from Bank of America-Merrill Lynch and are 15+ years, yield to maturity; State and local bond yields from Bank of America-Merrill Lynch, A-rated, yield to maturity; Mortgage rates from Freddie Mac, 30-year, fixed; LIBOR quotes from Intercontinental Exchange. All interest rate data are sourced from Haver Analytics. Historical data for Fed's Major Currency Index are from FRSR H.10. Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS). \*Interest rate data for 4Q 2019 are based on historical data through the week ended December 20. \*\*Data for 4Q 2019 for the Fed's AFE \$ Index based on data through week ended December 20. Figures for 4Q 2019 Real GDP, GDP Chained Price Index and Consumer Price Index are consensus forecasts based on a special question asked of the panelists this month.



## Long-Range Survey:

The table below contains the results of our twice-annual long-range CONSENSUS survey. There are also Top 10 and Bottom 10 averages for each variable. Shown are consensus estimates for the years 2021 through 2025 and averages for the five-year periods 2021-2025 and 2026-2030. Apply these projections cautiously. Few if any economic, demographic and political forces can be evaluated accurately over such long time spans.

		Average For The Year					Five-Year Averages	
		2021	2022	2023	2024	2025	2021-2025	2026-2030
1. Federal Funds Rate	CONSENSUS	1.5	1.9	2.1	2.3	2.4	2.1	2.4
	Top 10 Average	2.1	2.6	2.7	2.9	3.0	2.6	3.0
	Bottom 10 Average	1.0	1.2	1.5	1.8	1.9	1.5	1.9
2. Prime Rate	CONSENSUS	4.5	4.9	5.1	5.4	5.5	5.1	5.5
	Top 10 Average	5.0	5.5	5.7	6.0	6.0	5.6	6.0
	Bottom 10 Average	4.0	4.3	4.6	4.9	5.0	4.5	5.0
3. LIBOR, 3-Mo.	CONSENSUS	1.9	2.2	2.4	2.6	2.7	2.3	2.7
	Top 10 Average	2.4	2.7	2.9	3.1	3.2	2.9	3.2
	Bottom 10 Average	1.4	1.6	1.8	2.0	2.2	1.8	2.2
4. Commercial Paper, 1-Mo.	CONSENSUS	1.7	2.1	2.3	2.5	2.7	2.3	2.7
	Top 10 Average	2.2	2.5	2.8	3.0	3.1	2.7	3.1
	Bottom 10 Average	1.3	1.6	1.8	2.1	2.2	1.8	2.2
5. Treasury Bill Yield, 3-Mo.	CONSENSUS	1.5	1.8	2.0	2.3	2.4	2.0	2.4
	Top 10 Average	2.1	2.6	2.7	2.9	3.0	2.6	3.0
	Bottom 10 Average	1.0	1.2	1.4	1.7	1.8	1.4	1.8
6. Treasury Bill Yield, 6-Mo.	CONSENSUS	1.6	1.9	2.2	2.4	2.5	2.1	2.5
	Top 10 Average	2.2	2.6	2.8	3.0	3.1	2.7	3.1
	Bottom 10 Average	1.1	1.3	1.5	1.8	2.0	1.5	2.0
7. Treasury Bill Yield, 1-Yr.	CONSENSUS	1.7	2.0	2.2	2.5	2.6	2.2	2.7
	Top 10 Average	2.3	2.7	2.9	3.2	3.2	2.8	3.2
	Bottom 10 Average	1.2	1.3	1.6	1.9	2.1	1.6	2.1
8. Treasury Note Yield, 2-Yr.	CONSENSUS	1.8	2.1	2.4	2.6	2.7	2.3	2.8
	Top 10 Average	2.4	2.8	3.1	3.3	3.4	3.0	3.4
	Bottom 10 Average	1.2	1.5	1.7	2.0	2.2	1.7	2.2
10. Treasury Note Yield, 5-Yr.	CONSENSUS	2.0	2.3	2.6	2.8	2.9	2.5	3.0
	Top 10 Average	2.6	3.0	3.2	3.5	3.5	3.2	3.6
	Bottom 10 Average	1.5	1.7	1.9	2.1	2.3	1.9	2.3
11. Treasury Note Yield, 10-Yr.	CONSENSUS	2.3	2.5	2.8	3.0	3.1	2.8	3.2
	Top 10 Average	2.9	3.3	3.6	3.8	3.9	3.5	4.0
	Bottom 10 Average	1.8	1.9	2.1	2.3	2.4	2.1	2.5
12. Treasury Bond Yield, 30-Yr.	CONSENSUS	2.8	3.0	3.2	3.5	3.6	3.2	3.7
	Top 10 Average	3.3	3.6	4.0	4.2	4.3	3.9	4.4
	Bottom 10 Average	2.2	2.4	2.5	2.7	2.9	2.6	2.9
13. Corporate Aaa Bond Yield	CONSENSUS	3.7	4.0	4.3	4.5	4.6	4.2	4.7
	Top 10 Average	4.3	4.6	4.9	5.2	5.3	4.9	5.4
	Bottom 10 Average	3.2	3.4	3.6	3.7	3.9	3.6	4.0
13. Corporate Baa Bond Yield	CONSENSUS	4.7	4.9	5.2	5.4	5.6	5.2	5.6
	Top 10 Average	5.3	5.6	5.9	6.2	6.3	5.9	6.4
	Bottom 10 Average	4.2	4.3	4.4	4.6	4.8	4.5	4.8
14. State & Local Bonds Yield	CONSENSUS	3.6	3.7	3.9	4.1	4.2	3.9	4.2
	Top 10 Average	4.0	4.3	4.5	4.6	4.7	4.4	4.7
	Bottom 10 Average	3.2	3.2	3.3	3.5	3.7	3.4	3.8
15. Home Mortgage Rate	CONSENSUS	4.1	4.2	4.5	4.7	4.8	4.5	4.9
	Top 10 Average	4.5	4.8	5.1	5.4	5.4	5.0	5.5
	Bottom 10 Average	3.7	3.7	3.9	4.1	4.2	3.9	4.2
A. Fed's AFE Nominal \$ Index	CONSENSUS	108.8	108.8	109.1	109.2	108.8	108.9	108.3
	Top 10 Average	110.6	110.7	111.1	111.5	111.6	111.1	111.8
	Bottom 10 Average	107.0	107.0	107.1	107.1	106.5	106.9	105.7
		Year-Over-Year, % Change					Five-Year Averages	
		2021	2022	2023	2024	2025	2021-2025	2026-2030
B. Real GDP	CONSENSUS	1.9	2.0	2.0	1.9	2.0	1.9	2.0
	Top 10 Average	2.4	2.4	2.3	2.2	2.2	2.3	2.3
	Bottom 10 Average	1.4	1.6	1.6	1.7	1.7	1.6	1.7
C. GDP Chained Price Index	CONSENSUS	2.2	2.3	2.3	2.2	2.2	2.2	2.2
	Top 10 Average	2.6	2.8	2.7	2.6	2.6	2.7	2.6
	Bottom 10 Average	1.8	1.8	1.9	1.9	1.9	1.9	1.9
D. Consumer Price Index	CONSENSUS	2.1	2.2	2.2	2.2	2.1	2.2	2.1
	Top 10 Average	2.4	2.4	2.5	2.4	2.3	2.4	2.3
	Bottom 10 Average	1.8	1.9	2.0	2.0	1.9	1.9	2.0

Blue Granite Water Company  
Derivation of Mean Equity Risk Premium Based Studies  
Using Holding Period Returns and  
Projected Market Appreciation of the S&P Utility Index

<u>Line No.</u>		<u>Implied Equity Risk Premium</u>
	<u>Equity Risk Premium based on S&amp;P Utility Index Holding Period Returns (1):</u>	
1.	Historical Equity Risk Premium	4.21 %
2.	Regression of Historical Equity Risk Premium (2)	6.41
3.	Forecasted Equity Risk Premium Based on PRPM (3)	3.85
4.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Value Line Data) (4)	6.24
5.	Forecasted Equity Risk Premium based on Projected Total Return on the S&P Utilities Index (Bloomberg Data) (5)	<u>4.85</u>
6.	Average Equity Risk Premium (6)	<u><u>5.11 %</u></u>

- Notes: (1) Based on S&P Public Utility Index monthly total returns and Moody's Public Utility Bond average monthly yields from 1928-2019. Holding period returns are calculated based upon income received (dividends and interest) plus the relative change in the market value of a security over a one-year holding period.
- (2) This equity risk premium is based on a regression of the monthly equity risk premiums of the S&P Utility Index relative to Moody's A rated public utility bond yields from 1928 - 2019 referenced in note 1 above.
- (3) The Predictive Risk Premium Model (PRPM) is applied to the risk premium of the monthly total returns of the S&P Utility Index and the monthly yields on Moody's A rated public utility bonds from January 1928 - December 2019.
- (4) Using data from Value Line for the S&P Utilities Index, an expected return of 10.29% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 4.05%, calculated on line 3 of page 13 of this Schedule results in an equity risk premium of 6.30%. (10.29% - 4.05% = 6.24%)
- (5) Using data from Bloomberg Professional Service for the S&P Utilities Index, an expected return of 8.90% was derived based on expected dividend yields and long-term growth estimates as a proxy for market appreciation. Subtracting the expected A rated public utility bond yield of 4.05%, calculated on line 3 of page 13 of this Schedule results in an equity risk premium of 4.85%. (8.90% - 4.05% = 4.85%)
- (6) Average of lines 1 through 5.

**Blue Granite Water Company**  
**Indicated Common Equity Cost Rate Through Use**  
**of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)**

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Seven Water Companies	Value Line Adjusted Beta	Bloomberg Adjusted Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
American States Water Co.	0.65	0.54	0.60	9.49 %	2.70 %	8.40 %	9.34 %	8.87 %
American Water Works Company Inc	0.55	0.61	0.58	9.49	2.70	8.21	9.20	8.70
Artesian Resources Corporation	0.65	0.57	0.61	9.49	2.70	8.49	9.42	8.95
California Water Service Group	0.70	0.65	0.68	9.49	2.70	9.15	9.91	9.53
Middlesex Water Co.	0.75	0.74	0.75	9.49	2.70	9.82	10.41	10.12
SJW Corp.	0.60	0.62	0.61	9.49	2.70	8.49	9.42	8.95
York Water Co.	0.70	0.67	0.69	9.49	2.70	9.25	9.99	9.62
Mean			0.65			8.83 %	9.67 %	9.25 %
Median			0.61			8.49 %	9.42 %	8.95 %
Average of Mean and Median			0.63			8.66	9.55	9.10 %

Notes on page 24 of this Schedule.



Blue Granite Water Company  
Notes to Accompany the Application of the CAPM and ECAPM

Notes:

- (1) The market risk premium (MRP) is derived by using six different measures from three sources: Ibbotson, Value Line, and Bloomberg as illustrated below:

Historical Data MRP Estimates:

Measure 1: Ibbotson Arithmetic Mean MRP (1926-2019)

Arithmetic Mean Monthly Returns for Large Stocks 1926-2019:	11.89 %
Arithmetic Mean Income Returns on Long-Term Government Bonds:	<u>5.12</u>
MRP based on Ibbotson Historical Data:	<u>6.77 %</u>

Measure 2: Application of a Regression Analysis to Ibbotson Historical Data (1926-2018)

9.63 %

Measure 3: Application of the PRPM to Ibbotson Historical Data: (January 1926 - December 2019)

8.31 %

Value Line MRP Estimates:

Measure 4: Value Line Projected MRP (Thirteen weeks ending January 17, 2020)

Total projected return on the market 3-5 years hence*:	12.08 %
Projected Risk-Free Rate (see note 2):	<u>2.70</u>
MRP based on Value Line Summary & Index:	<u>9.38 %</u>

\*Forecasted 3-5 year capital appreciation plus expected dividend yield

Measure 5: Value Line Projected Return on the Market based on the S&P 500

Total return on the Market based on the S&P 500:	14.53 %
Projected Risk-Free Rate (see note 2):	<u>2.70</u>
MRP based on Value Line data	<u>11.83 %</u>

Measure 6: Bloomberg Projected MRP

Total return on the Market based on the S&P 500:	13.73 %
Projected Risk-Free Rate (see note 2):	<u>2.70</u>
MRP based on Bloomberg data	<u>11.03 %</u>

Average of Value Line, Ibbotson, and Bloomberg MRP: 9.49 %

- (2) For reasons explained in the direct testimony, the appropriate risk-free rate for cost of capital purposes is the average forecast of 30 year Treasury Bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts. (See pages 20-21 of this Schedule.) The projection of the risk-free rate is illustrated below:

First Quarter 2020	2.30 %
Second Quarter 2020	2.40
Third Quarter 2020	2.40
Fourth Quarter 2020	2.50
First Quarter 2021	2.50
Second Quarter 2021	2.60
2021-2025	3.20
2026-2030	<u>3.70</u>
	<u>2.70 %</u>

- (3) Average of Column 6 and Column 7.

Sources of Information:

Value Line Summary and Index  
Blue Chip Financial Forecasts, January 1, 2020 and December 1, 2019  
Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.  
Bloomberg Professional Services

Blue Granite Water Company  
Basis of Selection of the Group of Non-Price Regulated Companies  
Comparable in Total Risk to the Utility Proxy Group

The criteria for selection of the Non-Price Regulated Proxy Group was that the non-price regulated companies be domestic and reported in Value Line Investment Survey (Standard Edition).

The Non-Price Regulated Proxy Group was then selected based on the unadjusted beta range of 0.23 – 0.69 and residual standard error of the regression range of 2.7169 – 3.2405 of the Utility Proxy Group.

These ranges are based upon plus or minus two standard deviations of the unadjusted beta and standard error of the regression. Plus or minus two standard deviations captures 95.50% of the distribution of unadjusted betas and residual standard errors of the regression.

The standard deviation of the Utility Proxy Group's residual standard error of the regression is 0.1309. The standard deviation of the standard error of the regression is calculated as follows:

$$\text{Standard Deviation of the Std. Err. of the Regr.} = \frac{\text{Standard Error of the Regression}}{\sqrt{2N}}$$

where: N = number of observations. Since Value Line betas are derived from weekly price change observations over a period of five years, N = 259

$$\text{Thus, } 0.1309 = \frac{2.9787}{\sqrt{518}} = \frac{2.9787}{22.7596}$$

Source of Information: Value Line, Inc., December 2019  
Value Line Investment Survey (Standard Edition)

Blue Granite Water Company  
Basis of Selection of Comparable Risk  
Domestic Non-Price Regulated Companies

	[1]	[2]	[3]	[4]
Proxy Group of Seven Water Companies	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
American States Water Co.	0.70	0.52	2.7606	0.1051
American Water Works Company Inc	0.55	0.31	2.0671	0.0787
Artesian Resources Corporation	0.60	0.35	3.3330	0.1269
California Water Service Group	0.70	0.54	2.8259	0.1076
Middlesex Water Co.	0.75	0.55	3.2001	0.1218
SJW Corp.	0.60	0.37	3.2738	0.1246
York Water Co.	0.75	0.56	3.3903	0.1291
Average	0.66	0.46	2.9787	0.1134
Beta Range (+/- 2 std. Devs. of Beta) 2 std. Devs. of Beta	0.23 0.23	0.69		
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.7169	3.2405		
Std. dev. of the Res. Std. Err.	0.1309			
2 std. devs. of the Res. Std. Err.	0.2618			

Source of Information: Valueline Proprietary Database, December 2019

Blue Granite Water Company  
Proxy Group of Non-Price Regulated Companies  
Comparable in Total Risk to the  
Proxy Group of Seven Water Companies

	[1]	[2]	[3]	[4]
Proxy Group of Thirteen Non-Price Regulated Companies	VL Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
AutoZone Inc.	0.80	0.68	2.8167	0.1072
Bunge Ltd.	0.80	0.68	3.2030	0.1219
Cheesecake Factory	0.70	0.54	2.8539	0.1087
Casey's Gen'l Stores	0.70	0.52	3.0696	0.1169
Cboe Global Markets	0.70	0.52	2.8145	0.1072
Cracker Barrel	0.75	0.59	3.0393	0.1157
Dollar General	0.80	0.67	3.0401	0.1157
Dunkin' Brands Group	0.60	0.38	2.7913	0.1063
Darden Restaurants	0.80	0.64	2.9354	0.1118
Integra LifeSciences	0.80	0.64	3.0015	0.1143
Lamb Weston Holdings	0.75	0.57	2.7437	0.1768
Texas Roadhouse	0.80	0.69	3.0305	0.1154
Viad Corp.	0.80	0.64	3.0650	0.1167
Average	0.75	0.60	2.9500	0.1200
Proxy Group of Seven Water Companies	0.66	0.46	2.9787	0.1134

Source of Information:

Valueline Proprietary Database, December 2019

Blue Granite Water Company  
Summary of Cost of Equity Models Applied to  
Proxy Group of Thirteen Non-Price Regulated Companies  
Comparable in Total Risk to the  
Proxy Group of Seven Water Companies

<u>Principal Methods</u>	<u>Proxy Group of Thirteen Non- Price Regulated Companies</u>
Discounted Cash Flow Model (DCF) (1)	12.64 %
Risk Premium Model (RPM) (2)	11.04
Capital Asset Pricing Model (CAPM) (3)	<u>10.17</u>
Mean	<u>11.28 %</u>
Median	<u>11.04 %</u>
Average of Mean and Median	<u>11.16 %</u>

Notes:

- (1) From page 29 of this Schedule.
- (2) From page 30 of this Schedule.
- (3) From page 33 of this Schedule.

Blue Granite Water Company  
DCF Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the  
Proxy Group of Seven Water Companies

[1]	[2]	[4]	[5]	[6]	[7]	[8]	
Proxy Group of Thirteen Non-Price Regulated Companies	Average Dividend Yield	Value Line Projected Five Year Growth in EPS	Zack's Five Year Projected Growth Rate in EPS	Yahoo! Finance Projected Five Year Growth in EPS	Average Projected Five Year Growth Rate in EPS	Adjusted Dividend Yield	Indicated Common Equity Cost Rate (1)
	%	%	%	%	%	%	%
AutoZone Inc.	-	13.50	11.20	10.95	11.88	-	NA
Bunge Ltd.	3.61	17.00	NA	10.10	13.55	3.85	17.40
Cheesecake Factory	3.48	9.00	11.00	8.13	9.38	3.64	13.02
Casey's Gen'l Stores	0.77	6.50	9.10	10.56	8.72	0.80	9.52
Cboe Global Markets	1.22	14.50	5.90	2.14	7.51	1.27	8.78
Cracker Barrel	3.31	11.00	1.10	(0.40)	6.05	3.41	9.46
Dollar General	2.69	12.00	11.40	10.83	11.41	2.84	14.25
Dunkin' Brands Group	0.95	10.00	10.90	7.86	9.59	1.00	10.59
Darden Restaurants	4.65	11.00	9.20	8.31	9.50	4.87	14.37
Integra LifeSciences	-	12.00	12.40	13.19	12.53	-	NA
Lamb Weston Holdings	1.56	11.00	8.80	8.30	9.37	1.63	11.00
Texas Roadhouse	1.43	14.50	11.30	9.11	11.64	1.51	13.15
Viad Corp.	0.71	11.00	NA	14.00	12.50	0.75	13.25
						Mean	12.25
						Median	13.02
						Average of Mean and Median	12.64

NA= Not Available  
NMF= Not Meaningful Figure

(1) The application of the DCF model to the domestic, non-price regulated comparable risk companies is identical to the application of the DCF to the utility proxy group. The dividend yield is derived by using the 60 day average price and the spot indicated dividend as of January 17, 2020. The dividend yield is then adjusted by 1/2 the average projected growth rate in EPS, which is calculated by averaging the 5 year projected growth in EPS provided by Value Line, www.reuters.com, www.zacks.com, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information:  
Value Line Investment Survey  
www.reuters.com Downloaded on 01/17/2020  
www.zacks.com Downloaded on 01/17/2020  
www.yahoo.com Downloaded on 01/17/2020

Blue Granite Water Company  
Indicated Common Equity Cost Rate  
Through Use of a Risk Premium Model  
Using an Adjusted Total Market Approach

<u>Line No.</u>		<u>Proxy Group of Thirteen Non-Price Regulated Companies</u>
1.	Prospective Yield on Baa Rated Corporate Bonds (1)	4.60 %
2.	Equity Risk Premium (2)	<u>6.44</u>
3.	Risk Premium Derived Common Equity Cost Rate	<u><u>11.04</u> %</u>

Notes: (1) Average forecast of Baa corporate bonds based upon the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated January 1, 2020 and December 1, 2019 (see pages 20-21 of this Schedule). The estimates are detailed below.

First Quarter 2020	4.10 %
Second Quarter 2020	4.20
Third Quarter 2020	4.30
Fourth Quarter 2020	4.40
First Quarter 2021	4.50
Second Quarter 2021	4.50
2021-2025	5.20
2026-2030	<u>5.60</u>
Average	<u><u>4.60</u> %</u>

(2) From page 32 of this Schedule.

Blue Granite Water Company  
Comparison of Long-Term Issuer Ratings for the  
Proxy Group of Thirteen Non-Price Regulated Companies of Comparable risk to the  
Proxy Group of Seven Water Companies

	Moody's Long-Term Issuer Rating January 2020		Standard & Poor's Long-Term Issuer Rating January 2020	
<u>Proxy Group of Thirteen Non-Price Regulated Companies</u>	<u>Long-Term Issuer Rating</u>	<u>Numerical Weighting (1)</u>	<u>Long-Term Issuer Rating</u>	<u>Numerical Weighting (1)</u>
AutoZone Inc.	Baa1	8.0	BBB	9.0
Bunge Ltd.	NR	--	BBB	9.0
Cheesecake Factory	NR	--	NR	--
Casey's Gen'l Stores	NR	--	NR	--
Cboe Global Markets	A3	7.0	A-	7.0
Cracker Barrel	WR	--	NR	--
Dollar General	Baa2	9.0	BBB	9.0
Dunkin' Brands Group	NR	--	NR	--
Darden Restaurants	Baa2	9.0	BBB	9.0
Integra LifeSciences	NR	--	NR	--
Lamb Weston Holdings	Ba2	12.0	BB+	11.0
Texas Roadhouse	NR	--	NR	--
Viad Corp.	WR	--	NR	--
Average	<u>Baa2</u>	<u>9.0</u>	<u>BBB</u>	<u>9.0</u>

Notes:

(1) From page 16 of this Schedule.

Source of Information:

Bloomberg Professional Services



Blue Granite Water Company  
Derivation of Equity Risk Premium Based on the Total Market Approach  
Using the Beta for  
Proxy Group of Thirteen Non-Price Regulated Companies of Comparable risk to the  
Proxy Group of Seven Water Companies

<u>Line No.</u>	<u>Equity Risk Premium Measure</u>	<u>Proxy Group of Thirteen Non-Price Regulated Companies</u>
<u>Ibbotson-Based Equity Risk Premiums:</u>		
1.	Ibbotson Equity Risk Premium (1)	5.54 %
2.	Regression on Ibbotson Risk Premium Data (2)	8.61
3.	Ibbotson Equity Risk Premium based on PRPM (3)	7.38
4.	Equity Risk Premium Based on <u>Value Line</u> Summary and Index (4)	8.40
5	Equity Risk Premium Based on <u>Value Line</u> S&P 500 Companies (5)	10.85
6.	Equity Risk Premium Based on Bloomberg S&P 500 Companies (6)	<u>10.05</u>
7.	Conclusion of Equity Risk Premium	8.47 %
8.	Adjusted Beta (7)	<u>0.76</u>
9.	Forecasted Equity Risk Premium	<u><u>6.44 %</u></u>

Notes:

- (1) From note 1 of page 19 of this Schedule.
- (2) From note 2 of page 19 of this Schedule.
- (3) From note 3 of page 19 of this Schedule.
- (4) From note 4 of page 19 of this Schedule.
- (5) From note 5 of page 19 of this Schedule.
- (6) From note 6 of page 19 of this Schedule.
- (7) Average of mean and median beta from page 33 of this Schedule.

Sources of Information:

Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.  
Value Line Summary and Index  
Blue Chip Financial Forecasts, January 1, 2020 and December 1, 2019  
Bloomberg Professional Services

Blue Granite Water Company  
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Price-Regulated Companies Comparable in Total Risk to the  
Proxy Group of Seven Water Companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Proxy Group of Thirteen Non-Price Regulated Companies	Value Line Adjusted Beta	Bloomberg Beta	Average Beta	Market Risk Premium (1)	Risk-Free Rate (2)	Traditional CAPM Cost Rate	ECAPM Cost Rate	Indicated Common Equity Cost Rate (3)
AutoZone Inc.	0.80	0.64	0.72	9.49 %	2.70 %	9.53 %	10.20 %	9.87 %
Bunge Ltd.	0.80	0.59	0.69	9.49	2.70	9.25	9.99	9.62
Cheesecake Factory	0.80	0.76	0.78	9.49	2.70	10.10	10.63	10.36
Casey's Gen'l Stores	0.75	0.77	0.76	9.49	2.70	9.91	10.48	10.20
Cboe Global Markets	0.65	0.72	0.68	9.49	2.70	9.15	9.91	9.53
Cracker Barrel	0.75	0.70	0.72	9.49	2.70	9.53	10.20	9.87
Dollar General	0.85	0.75	0.80	9.49	2.70	10.29	10.77	10.53
Dunkin' Brands Group	0.70	0.83	0.76	9.49	2.70	9.91	10.48	10.20
Darden Restaurants	0.80	0.75	0.78	9.49	2.70	10.10	10.63	10.36
Integra LifeSciences	0.85	0.87	0.86	9.49	2.70	10.86	11.20	11.03
Lamb Weston Holdings	0.70	0.54	0.62	9.49	2.70	8.58	9.49	9.04
Texas Roadhouse	0.80	0.85	0.82	9.49	2.70	10.48	10.91	10.70
Viad Corp.	0.80	0.80	0.80	9.49	2.70	10.29	10.77	10.53
Mean			0.75			9.85 %	10.43 %	10.14 %
Median			0.76			9.91 %	10.48 %	10.20 %
Average of Mean and Median			0.76			9.88 %	10.46 %	10.17 %

Notes:

- (1) From note 1, page 24 of this Schedule.  
(2) From note 2, page 24 of this Schedule.  
(3) Average of CAPM and ECAPM cost rates.

Blue Granite Water Company  
Demonstration of the Inadequacy of  
a DCF Return Rate Related to Book Value  
When Market Value is Greater than Book Value

Line No.		[A]	[B]	[C]	[D]	[E]	[F]
		Based on Mr. Parcell's DCF Recommendation (1)		Based on Mr. Rothschild's Constant Growth DCF Recommendation (2)		Based on Mr. Rothschild's Non-Constant Growth DCF Recommendation (3)	
		Market Value	Book Value	Market Value	Book Value	Market Value	Book Value
1.	Per Share	\$ 65.28 (4)	\$ 18.36 (5)	\$ 62.96 (6)	\$ 16.51 (5)	\$ 76.70 (7)	\$ 20.93 (5)
2.	DCF Cost Rate	8.90%	8.90%	8.76%	8.76%	6.96%	6.96%
3.	Return in Dollars (8)	\$ 5.810	\$ 1.634	\$ 5.516	\$ 1.446	\$ 5.339	\$ 1.456
4.	Dividends	\$ 1.162 (9)	\$ 1.162 (9)	\$ 1.121 (10)	\$ 1.121 (10)	\$ 1.485 (11)	\$ 1.485 (11)
5.	Growth in Dollars (12)	\$ 4.648	\$ 0.472	\$ 4.395	\$ 0.325	\$ 3.854	\$ (0.029)
6.	Return on Market Value (13)	8.90%	2.50%	8.76%	2.30%	6.96%	1.90%
7.	Rate of Growth on Market Value (14)	7.12%	0.72%	6.98%	0.52%	5.90%	-0.04%

Notes:

- (1) Mr. Parcell's DCF result using his Value Line Water Group data and application of prospective per share growth as shown on Exhibit DCP-2, Schedule 6, page 4.
- (2) Mr. Rothschild's high constant growth DCF result as shown on Exhibit ALR 4, page 1.
- (3) Mr. Rothschild's high non-constant growth DCF result as shown on Exhibit ALR 4, page 3.
- (4) Average of Mr. Parcell's Value Line Water Group as shown on Exhibit DCP-2, Schedule 6, page 1.
- (5) Average book value dividing total common equity at year-end 2018 by common shares outstanding at year-end 2018 for each proxy group company.
- (6) Average LTM market price for each company as derived from Exhibit ALR 2, page 2.
- (7) Average 2023 price for Mr. Rothschild's proxy group as shown on Exhibit ALR 4, page 3.
- (8) Line 1 x Line 2.
- (9) Dividends are based on the average 1.78% dividend yield for Mr. Parcell's Value Line Water Group as shown on Exhibit DCP-2, Schedule 6, page 1.
- (10) Dividends are based on the average 1.78% dividend yield for Mr. Rothschild's proxy group as shown on Exhibit ALR 2, page 2.
- (11) Dividends are based on the average 1.94% dividend yield derived by dividing 2023 expected dividends by 2023 expected prices of Mr. Rothschild's proxy group as presented in Exhibit ALR 4, page 3.
- (12) Line 3 - Line 4.
- (13) Line 3 / Line 1.
- (14) Line 5 / Line 1.

Blue Granite Water Company  
Calculation of Indicated DCF Applied to Book Value Capital Structure

Based on Mr. Parcell's Value Line Water Group  
Un-lever Indicated Market Capital Structure DCF

$$\begin{aligned}
 K_u &= K_e - \left( \left( K_u - i \right) \frac{1 - t}{D/E} \right) - \left( K_u - d \right) \frac{P}{E} \\
 K_u &= 8.90\% - \left( \left( K_u - 5.18\% \right) \frac{1 - 21\%}{23.72\% / 76.24\%} \right) - \left( K_u - 7.38\% \right) \frac{0.03\%}{76.24\%} \\
 K_u &= 8.90\% - \left( \left( K_u - 5.18\% \right) 79.00\% \right) 31.11\% - \left( K_u - 7.38\% \right) 0.04\% \\
 K_u &= 8.90\% - \left( 79.00\% * K_u - 4.0916\% \right) 31.11\% - \left( 0.04\% * K_u - 0.00\% \right) \\
 K_u &= 8.90\% - \left( 24.58\% * K_u - 1.27\% \right) -0.04\% * K_u + 0.00\% \\
 K_u &= 8.90\% -24.58\% * K_u + 1.27\% -0.04\% * K_u + 0.00\% \\
 K_u &= 10.18\% -24.63\% * K_u \\
 124.63\% * K_u &= 10.18\% \\
 K_u &= \mathbf{8.17\%}
 \end{aligned}$$

Re-lever to Indicated Book Value Capital Structure DCF

$$\begin{aligned}
 K_e &= K_u + \left( \left( K_u - i \right) \frac{1 - t}{D/E} \right) + \left( K_u - d \right) \frac{P}{E} \\
 K_e &= 8.17\% + \left( \left( 8.17\% - 5.18\% \right) \frac{1 - 21\%}{44.95\% / 54.97\%} \right) + \left( 8.17\% - 7.38\% \right) \frac{0.08\%}{54.97\%} \\
 K_e &= 8.17\% + \left( 2.99\% \right) 79\% 81.77\% + \left( 0.79\% \right) 0.15\% \\
 K_e &= 8.17\% + \left( 2.36\% \right) 81.77\% + \left( 0.00\% \right) \\
 K_e &= 8.17\% + \left( 1.93\% \right) + 0.00\% \\
 K_e &= \mathbf{10.10\%}
 \end{aligned}$$

Where:

- K<sub>u</sub> = Un-levered (i.e., 100% equity) cost of common equity
- K<sub>e</sub> = Market determined cost of common equity
- i = Cost of debt
- t = Income tax rate
- D = Debt ratio
- E = Equity ratio
- d = Cost of preferred stock
- P = Preferred equity ratio

Blue Granite Water Company  
Calculation of Indicated DCF Applied to Book Value Capital Structure

Based on Mr. Rothschild's Proxy Group - Constant Growth DCF Results  
Un-lever Indicated Market Capital Structure DCF

$$\begin{aligned}
 K_u &= K_e - (((K_u - i) 1 - t) D / E) - (K_u - d) P / E \\
 K_u &= 8.76\% - (((K_u - 5.09\%) 1 - 21\%) 23.14\% / 76.82\%) - (K_u - 7.38\%) 0.05\% / 76.82\% \\
 K_u &= 8.76\% - (((K_u - 5.09\%) 79.00\%) 30.12\%) - (K_u - 7.38\%) 0.06\% \\
 K_u &= 8.76\% - ((79.00\% * K_u - 4.0210\%) 30.12\%) - (0.06\% * K_u - 0.00\%) \\
 K_u &= 8.76\% - (23.80\% * K_u - 1.21\%) -0.06\% * K_u + 0.00\% \\
 K_u &= 8.76\% -23.80\% * K_u + 1.21\% -0.06\% * K_u + 0.00\% \\
 K_u &= 9.98\% -23.85\% * K_u \\
 123.85\% * K_u &= 9.98\% \\
 K_u &= \mathbf{8.05\%}
 \end{aligned}$$

Re-lever to Indicated Book Value Capital Structure DCF

$$\begin{aligned}
 K_e &= K_u + (((K_u - i) 1 - t) D / E) + (K_u - d) P / E \\
 K_e &= 8.05\% + (((8.05\% - 5.09\%) 1 - 21\%) 47.25\% / 52.64\%) + (8.05\% - 7.38\%) 0.11\% / 52.64\% \\
 K_e &= 8.05\% + (((2.96\%) 79\%) 89.76\%) + (0.68\%) 0.21\% \\
 K_e &= 8.05\% + ((2.34\%) 89.76\%) + (0.00\%) \\
 K_e &= 8.05\% + (2.10\%) + 0.00\% \\
 K_e &= \mathbf{10.16\%}
 \end{aligned}$$

Where:

- K<sub>u</sub> = Un-levered (i.e., 100% equity) cost of common equity
- K<sub>e</sub> = Market determined cost of common equity
- i = Cost of debt
- t = Income tax rate
- D = Debt ratio
- E = Equity ratio
- d = Cost of preferred stock
- P = Preferred equity ratio

Blue Granite Water Company  
Calculation of Indicated DCF Applied to Book Value Capital Structure

Based on Mr. Rothschild's Proxy Group - Non-Constant Growth DCF Results  
Un-lever Indicated Market Capital Structure DCF

$$\begin{aligned}
 K_u &= K_e - (((K_u - i) 1 - t) D / E) - (K_u - d) P / E \\
 K_u &= 6.96\% - (((K_u - 5.09\%) 1 - 21\%) 23.14\% / 76.82\%) - (K_u - 7.38\%) 0.05\% / 76.82\% \\
 K_u &= 6.96\% - (((K_u - 5.09\%) 79.00\%) 30.12\%) - (K_u - 7.38\%) 0.06\% \\
 K_u &= 6.96\% - ((79.00\% * K_u - 4.0210\%) 30.12\%) - (0.06\% * K_u - 0.00\%) \\
 K_u &= 6.96\% - (23.80\% * K_u - 1.21\%) -0.06\% * K_u + 0.00\% \\
 K_u &= 6.96\% -23.80\% * K_u + 1.21\% -0.06\% * K_u + 0.00\% \\
 K_u &= 8.18\% -23.85\% * K_u \\
 123.85\% * K_u &= 8.18\% \\
 K_u &= \mathbf{6.60\%}
 \end{aligned}$$

Re-lever to Indicated Book Value Capital Structure DCF

$$\begin{aligned}
 K_e &= K_u + (((K_u - i) 1 - t) D / E) + (K_u - d) P / E \\
 K_e &= 6.60\% + (((6.60\% - 5.09\%) 1 - 21\%) 47.25\% / 52.64\%) + (6.60\% - 7.38\%) 0.11\% / 52.64\% \\
 K_e &= 6.60\% + (((1.51\%) 79\%) 89.76\%) + (-0.78\%) 0.21\% \\
 K_e &= 6.60\% + ((1.19\%) 89.76\%) + (0.00\%) \\
 K_e &= 6.60\% + (1.07\%) + 0.00\% \\
 K_e &= \mathbf{7.67\%}
 \end{aligned}$$

Where:

- K<sub>u</sub> = Un-levered (i.e., 100% equity) cost of common equity
- K<sub>e</sub> = Market determined cost of common equity
- i = Cost of debt
- t = Income tax rate
- D = Debt ratio
- E = Equity ratio
- d = Cost of preferred stock
- P = Preferred equity ratio

Blue Granite Water Company  
Market Returns and Market Risk Premiums 1926 - 2018

	Large Company Stocks Total Returns	Long-Term Government Bond Income Returns	
Year	Jan-Dec*	Jan-Dec*	MRP
1926	11.62%	3.73%	7.89%
1927	37.49%	3.41%	34.08%
1928	43.61%	3.22%	40.39%
1929	-8.42%	3.47%	-11.89%
1930	-24.90%	3.32%	-28.22%
1931	-43.34%	3.33%	-46.67%
1932	-8.19%	3.69%	-11.88%
1933	53.99%	3.12%	50.87%
1934	-1.44%	3.18%	-4.62%
1935	47.67%	2.81%	44.86%
1936	33.92%	2.77%	31.15%
1937	-35.03%	2.66%	-37.69%
1938	31.12%	2.64%	28.48%
1939	-0.41%	2.40%	-2.81%
1940	-9.78%	2.23%	-12.01%
1941	-11.59%	1.94%	-13.53%
1942	20.34%	2.46%	17.88%
1943	25.90%	2.44%	23.46%
1944	19.75%	2.46%	17.29%
1945	36.44%	2.34%	34.10%
1946	-8.07%	2.04%	-10.11%
1947	5.71%	2.13%	3.58%
1948	5.50%	2.40%	3.10%
1949	18.79%	2.25%	16.54%
1950	31.71%	2.12%	29.59%
1951	24.02%	2.38%	21.64%
1952	18.37%	2.66%	15.71%
1953	-0.99%	2.84%	-3.83%
1954	52.62%	2.79%	49.83%
1955	31.56%	2.75%	28.81%
1956	6.56%	2.99%	3.57%
1957	-10.78%	3.44%	-14.22%
1958	43.36%	3.27%	40.09%
1959	11.96%	4.01%	7.95%
1960	0.47%	4.26%	-3.79%
1961	26.89%	3.83%	23.06%
1962	-8.73%	4.00%	-12.73%
1963	22.80%	3.89%	18.91%
1964	16.48%	4.15%	12.33%

Blue Granite Water Company  
Market Returns and Market Risk Premiums 1926 - 2018

Year	Large Company Stocks	Long-Term Government Bond	MRP
	Total Returns Jan-Dec*	Income Returns Jan-Dec*	
1965	12.45%	4.20%	8.25%
1966	-10.06%	4.49%	-14.55%
1967	23.98%	4.59%	19.39%
1968	11.06%	5.50%	5.56%
1969	-8.50%	5.95%	-14.45%
1970	3.86%	6.74%	-2.88%
1971	14.30%	6.32%	7.98%
1972	18.99%	5.87%	13.12%
1973	-14.69%	6.51%	-21.20%
1974	-26.47%	7.27%	-33.74%
1975	37.23%	7.99%	29.24%
1976	23.93%	7.89%	16.04%
1977	-7.16%	7.14%	-14.30%
1978	6.57%	7.90%	-1.33%
1979	18.61%	8.86%	9.75%
1980	32.50%	9.97%	22.53%
1981	-4.92%	11.55%	-16.47%
1982	21.55%	13.50%	8.05%
1983	22.56%	10.38%	12.18%
1984	6.27%	11.74%	-5.47%
1985	31.73%	11.25%	20.48%
1986	18.67%	8.98%	9.69%
1987	5.25%	7.92%	-2.67%
1988	16.61%	8.97%	7.64%
1989	31.69%	8.81%	22.88%
1990	-3.10%	8.19%	-11.29%
1991	30.47%	8.22%	22.25%
1992	7.62%	7.26%	0.36%
1993	10.08%	7.17%	2.91%
1994	1.32%	6.59%	-5.27%
1995	37.58%	7.60%	29.98%
1996	22.96%	6.18%	16.78%
1997	33.36%	6.64%	26.72%
1998	28.58%	5.83%	22.75%
1999	21.04%	5.57%	15.47%
2000	-9.10%	6.50%	-15.60%
2001	-11.89%	5.53%	-17.42%
2002	-22.10%	5.59%	-27.69%
2003	28.68%	4.80%	23.88%



Blue Granite Water Company  
Market Returns and Market Risk Premiums 1926 - 2018

Year	Large Company Stocks	Long-Term Government Bond	MRP
	Total Returns Jan-Dec*	Income Returns Jan-Dec*	
2004	10.88%	5.02%	5.86%
2005	4.91%	4.69%	0.22%
2006	15.79%	4.68%	11.11%
2007	5.49%	4.86%	0.63%
2008	-37.00%	4.45%	-41.45%
2009	26.46%	3.47%	22.99%
2010	15.06%	4.25%	10.81%
2011	2.11%	3.90%	-1.79%
2012	16.00%	2.46%	13.54%
2013	32.39%	2.88%	29.51%
2014	13.69%	3.41%	10.28%
2015	1.38%	2.47%	-1.09%
2016	11.96%	2.30%	9.66%
2017	21.83%	2.67%	19.16%
2018	-4.38%	2.82%	-7.20%
Ten-Year Average	13.65%	3.06%	10.59%
Long-Term Average	11.88%	4.97%	6.91%

Source of Information:

Duff & Phelps SBBI 2019 Yearbook: Stocks, Bonds, Bills and Inflation, Appendix A

Blue Granite Water Company  
Correction of Mr. Parcell's CAPM Results Reflecting a Corrected Proxy Group,  
Expected Risk-Free Rate, Expected MRP, and use of the ECAPM

**PROXY COMPANIES  
CAPM COST RATES**

Company	Risk-Free Rate	Beta	Risk Premium	CAPM Rates	ECAPM RATES	AVERAGE
<b>Value Line Water Group</b>						
American States Water Co.	2.70%	0.65	9.75%	9.0%	9.9%	<b>9.5%</b>
American Water Works Co.	2.70%	0.55	9.75%	8.1%	9.2%	<b>8.6%</b>
Aqua America, Inc.	2.70%	0.65	9.75%	9.0%	9.9%	<b>9.5%</b>
Artesian Resources	2.70%	0.65	9.75%	9.0%	9.9%	<b>9.5%</b>
California Water Service Group	2.70%	0.70	9.75%	9.5%	10.3%	<b>9.9%</b>
Middlesex Water Co.	2.70%	0.75	9.75%	10.0%	10.6%	<b>10.3%</b>
SJW Group	2.70%	0.60	9.75%	8.5%	9.5%	<b>9.0%</b>
York Water Co.	2.70%	0.70	9.75%	9.5%	10.3%	<b>9.9%</b>
Mean				<b>9.1%</b>	<b>9.9%</b>	<b>9.5%</b>
Median				<b>9.0%</b>	<b>10.3%</b>	<b>9.9%</b>
<b>Parcell Proxy Group</b>						
American States Water Co.	2.70%	0.65	9.75%	9.0%	9.9%	<b>9.5%</b>
American Water Works Co.	2.70%	0.55	9.75%	8.1%	9.2%	<b>8.6%</b>
California Water Service Group	2.70%	0.70	9.75%	9.5%	10.3%	<b>9.9%</b>
Middlesex Water Co.	2.70%	0.75	9.75%	10.0%	10.6%	<b>10.3%</b>
York Water Co.	2.70%	0.70	9.75%	9.5%	10.3%	<b>9.9%</b>
Mean				<b>9.2%</b>	<b>10.0%</b>	<b>9.6%</b>
Median				<b>9.5%</b>	<b>10.3%</b>	<b>9.9%</b>
<b>D'Ascendis Water Group</b>						
American States Water Co.	2.70%	0.65	9.75%	9.0%	9.9%	<b>9.5%</b>
American Water Works Co.	2.70%	0.55	9.75%	8.1%	9.2%	<b>8.6%</b>
Artesian Resources	2.70%	0.65	9.75%	9.0%	9.9%	<b>9.5%</b>
California Water Service Group	2.70%	0.70	9.75%	9.5%	10.3%	<b>9.9%</b>
Middlesex Water Co.	2.70%	0.75	9.75%	10.0%	10.6%	<b>10.3%</b>
York Water Co.	2.70%	0.70	9.75%	9.5%	10.3%	<b>9.9%</b>
Mean				<b>9.2%</b>	<b>10.0%</b>	<b>9.6%</b>
Median				<b>9.3%</b>	<b>10.1%</b>	<b>9.7%</b>

Please See page 2 for notes

Blue Granite Water Company  
Notes to Accompany the Application of the CAPM and ECAPM

Notes:

- (1) For reasons explained in the direct testimony, the appropriate risk-free rate for cost of capital purposes is the average forecast of 30 year Treasury Bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts. (See pages 20-21 of Schedule-1R). The projection of the risk-free rate is illustrated below:

First Quarter 2020	2.30 %
Second Quarter 2020	2.40
Third Quarter 2020	2.40
Fourth Quarter 2020	2.50
First Quarter 2021	2.50
Second Quarter 2021	2.60
2021-2025	3.20
2026-2030	3.70
	<u>2.70 %</u>

- (2) The market risk premium (MRP) is derived by using five different measures as illustrated below:

Measure 1: Regression Analysis of Pacrell Realized Returns\* 10.88 %  
\*from page 3 of this Schedule

Measure 2: Ibbotson Arithmetic Mean MRP (1926-2018)

MRP based on Ibbotson Historical Data: 6.77 %

Measure 3: Application of a Regression Analysis to Ibbotson Historical Data (1926-2018)  
9.63 %

Measure 4: Value Line Projected MRP (Thirteen weeks ending January 10, 2020)

Total projected return on the market 3-5 years hence\*: 12.29 %

Projected Risk-Free Rate (see note 1): 2.70

MRP based on Value Line Summary & Index: 9.59 %

\*Forecasted 3-5 year capital appreciation plus expected dividend yield

Measure 5: Value Line Projected Return on the Market based on the S&P 500

Total return on the Market based on the S&P 500: 14.57 %

Projected Risk-Free Rate (see note 1): 2.70

MRP based on Value Line data 11.87 %

Average: 9.75 %

Sources of Information:

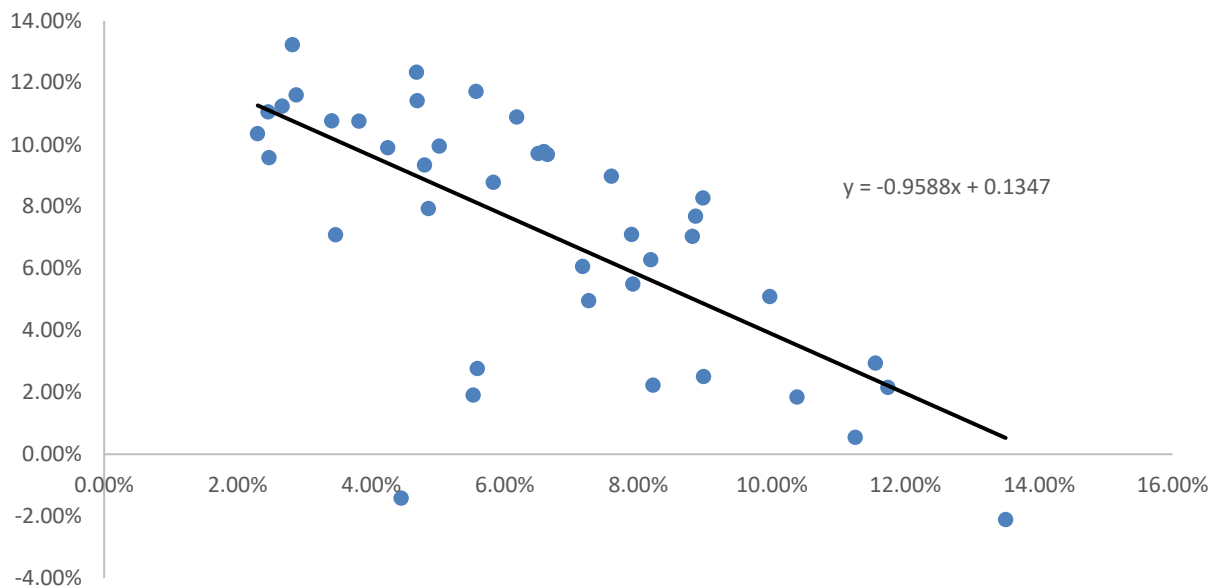
Exhibit DCP-2, Schedule 8

Value Line Summary and Index

Blue Chip Financial Forecasts, January 1, 2020 and December 1, 2019

Stocks, Bonds, Bills, and Inflation - 2019 SBBI Yearbook, John Wiley & Sons, Inc.

# Regression Analysis of Mr. Parcell's Earned Return Analysis

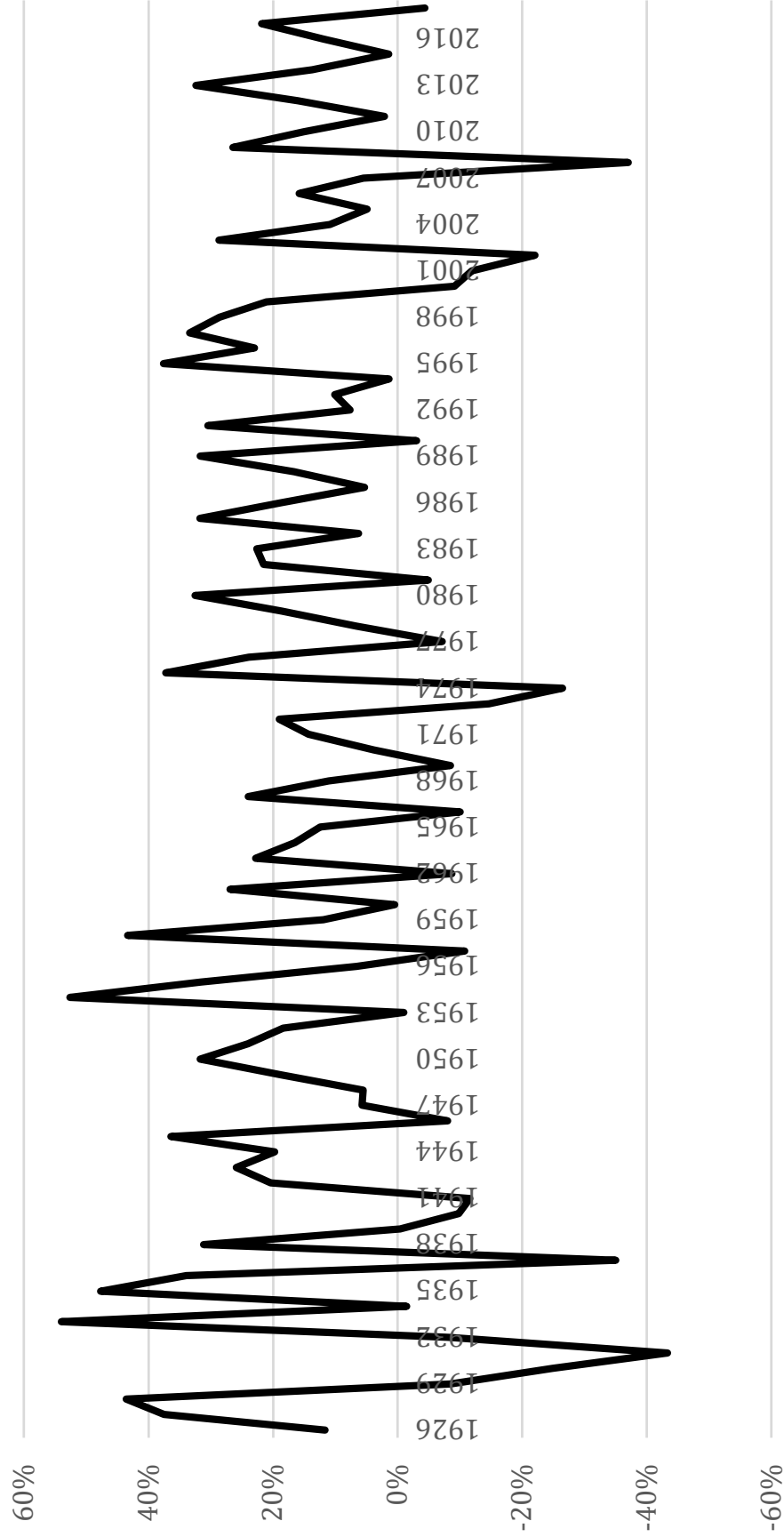


[1]	[2]	[3]	[4]
Risk-Free Rate(1)	Slope	Intercept	Market Risk Premium (2)
<u>2.70%</u>	<u>-0.9587996</u>	<u>13.47%</u>	<u>10.88%</u>

## Notes:

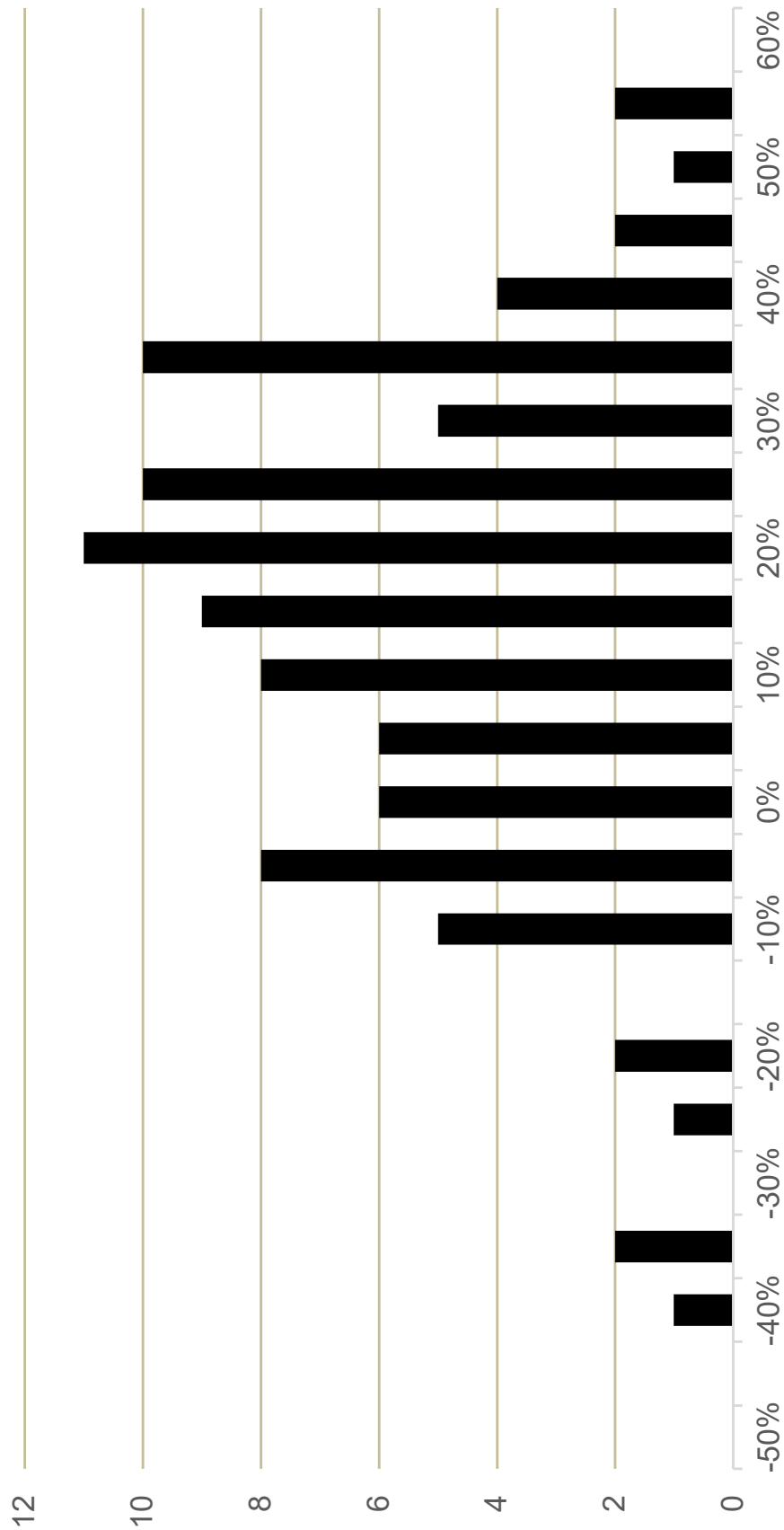
- (1) As calculated on note 1 of page 2 of this Schedule.
- (2) Column [1] x Column [2] + Column [3].

## U.S. Large Company Stock Returns 1926-2018



Source of Information: Duff & Phelps, SBBI 2019 Yearbook: Stocks, Bonds, Bills, and Inflation 1926-2018, Appendix A

## Frequency Distribution of Observed Market Returns 1926-2018



Source of Information: Duff & Phelps, SBBI 2019 Yearbook: Stocks, Bonds, Bills, and Inflation 1926-2018, Appendix A

Blue Granite Water Company  
Market-to-Book Ratios, Earnings / Book Ratios and  
Inflation for Standard & Poor's Industrial Index and  
the Standard & Poor's 500 Composite Index  
from 1947 through 2018

Year	Market-to-Book Ratio (1)		Earnings / Book Common Equity Ratio (2)		Inflation (4)	Earnings / Book Common Equity Ratio - Net of Inflation	
	S&P Industrial Index (3)	S&P 500 Composite Index (3)	S&P Industrial Index (3)	S&P 500 Composite Index (3)			
1947	1.23	NA	13.0 %	NA	9.0 %	4.0 %	NA
1948	1.13	NA	17.3	NA	2.7	14.6	NA
1949	1.00	NA	16.3	NA	(1.8)	18.1	NA
1950	1.16	NA	18.3	NA	5.8	12.5	NA
1951	1.27	NA	14.4	NA	5.9	8.5	NA
1952	1.29	NA	12.7	NA	0.9	11.8	NA
1953	1.21	NA	12.7	NA	0.6	12.1	NA
1954	1.45	NA	13.5	NA	(0.5)	14.0	NA
1955	1.81	NA	16.0	NA	0.4	15.6	NA
1956	1.92	NA	13.7	NA	2.9	10.8	NA
1957	1.71	NA	12.5	NA	3.0	9.5	NA
1958	1.70	NA	9.8	NA	1.8	8.0	NA
1959	1.94	NA	11.2	NA	1.5	9.7	NA
1960	1.82	NA	10.3	NA	1.5	8.8	NA
1961	2.01	NA	9.8	NA	0.7	9.1	NA
1962	1.83	NA	10.9	NA	1.2	9.7	NA
1963	1.94	NA	11.4	NA	1.7	9.8	NA
1964	2.18	NA	12.3	NA	1.2	11.1	NA
1965	2.21	NA	13.2	NA	1.9	11.3	NA
1966	2.00	NA	13.2	NA	3.4	9.9	NA
1967	2.05	NA	12.1	NA	3.0	9.1	NA
1968	2.17	NA	12.6	NA	4.7	7.9	NA
1969	2.10	NA	12.1	NA	6.1	6.0	NA
1970	1.71	NA	10.4	NA	5.5	4.9	NA
1971	1.99	NA	11.2	NA	3.4	7.8	NA
1972	2.16	NA	12.0	NA	3.4	8.6	NA
1973	1.96	NA	14.6	NA	8.8	5.8	NA
1974	1.39	NA	14.8	NA	12.2	2.6	NA
1975	1.34	NA	12.3	NA	7.0	5.3	NA
1976	1.51	NA	14.5	NA	4.8	9.7	NA
1977	1.38	NA	14.6	NA	6.8	7.8	NA
1978	1.25	NA	15.3	NA	9.0	6.3	NA
1979	1.23	NA	17.2	NA	13.3	3.9	NA
1980	1.31	NA	15.6	NA	12.4	3.2	NA
1981	1.24	NA	14.9	NA	8.9	6.0	NA
1982	1.17	NA	11.3	NA	3.9	7.4	NA
1983	1.45	NA	12.2	NA	3.8	8.4	NA
1984	1.46	NA	14.6	NA	4.0	10.7	NA
1985	1.67	NA	12.2	NA	3.8	8.4	NA
1986	2.02	NA	11.5	NA	1.1	10.4	NA
1987	2.50	NA	15.7	NA	4.4	11.3	NA
1988	2.13	NA	19.0	NA	4.4	14.6	NA
1989	2.56	NA	18.5	NA	4.7	13.9	NA
1990	2.63	NA	16.3	NA	6.1	10.2	NA
1991	2.77	NA	10.8	NA	3.1	7.8	NA
1992	3.29	NA	13.0	NA	2.9	10.1	NA
1993	3.72	NA	15.7	NA	2.8	13.0	NA
1994	3.73	NA	23.0	NA	2.7	20.3	NA
1995	4.06	2.64	22.9	16.0 %	2.5	20.4	13.5 %
1996	4.79	3.00	24.8	16.8	3.3	21.5	13.5
1997	5.88	3.53	24.6	16.3	1.7	22.9	14.6
1998	7.13	4.16	21.3	14.5	1.6	19.7	12.9
1999	8.27	4.76	25.2	17.1	2.7	22.5	14.4
2000	7.51	4.51	23.9	16.2	3.4	20.5	12.8
2001	NA	3.50	NA	7.4	1.6	NA	5.9
2002	NA	2.93	NA	8.3	2.4	NA	5.9
2003	NA	2.78	NA	14.1	1.9	NA	12.2
2004	NA	2.91	NA	15.3	3.3	NA	12.0
2005	NA	2.78	NA	16.4	3.4	NA	13.0
2006	NA	2.77	NA	17.0	2.5	NA	14.5
2007	NA	2.84	NA	12.8	4.1	NA	8.7
2008	NA	2.24	NA	3.0	0.1	NA	2.9
2009	NA	1.87	NA	10.6	2.7	NA	7.9
2010	NA	2.09	NA	14.2	1.5	NA	12.7
2011	NA	2.07	NA	14.6	3.0	NA	11.6
2012	NA	2.14	NA	13.5	1.7	NA	11.8
2013	NA	2.39	NA	14.5	1.5	NA	13.0
2014	NA	2.66	NA	14.2	0.8	NA	13.4
2015	NA	2.73	NA	11.8	0.7	NA	11.1
2016	NA	2.72	NA	12.5	2.1	NA	10.5
2017	NA	3.10	NA	13.8	2.1	NA	11.7
2018	NA	3.15	NA	15.8	1.9	NA	13.9

Notes:

- (1) Market-to-Book Ratio equals average of the high and low market price for the year divided by the average book value.
- (2) Earnings/Book equals earnings per share for the year divided by the average book
- (3) On January 2, 2001 Standard & Poor's released Global Industry Classification Standard (GICS) price indexes for all Standard & Poor's U.S. indexes. As a result, all S&P Indexes have been calculated with a common base of 100 at a start date of December 31, 1994. Also, the GICS industrial sector is not comparable to the former S&P Industrial Index and data for the former S&P Industrial Index was discontinued.
- (4) As measured by the Consumer Price Index (CPI).

Sources of Information:

Standard & Poor's Security Price Index Record, 2000 Edition, p. 40  
Standard & Poor's Statistical Service, Current Statistics, March 2013, p. 30  
Duff and Phelps SBB 2019 Yearbook Appendix A Tables, Stocks, Bonds, Bills, and Inflation | 1926-2018  
sp 500 eps est.xlsx. <http://www.spindices.com/indices/equity/sp-500>  
finance.yahoo.com

**Blue Granite Water Company**  
Coefficients of Variation of the  
Proxy Group of Seven Water Companies  
and the Proxy Group of Thirteen Non-Price Regulated Companies

Proxy Group of Seven Water Companies	Net Profit (millions)										Standard Deviation	Mean	Coefficient of Variation
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018			
American States Water Co.	\$ 29.5	\$ 41.4	\$ 42.0	\$ 54.1	\$ 62.7	\$ 61.1	\$ 60.5	\$ 59.7	\$ 69.4	\$ 63.9	\$ 12.0	\$ 54.4	0.2203
American Water Works Company Inc	209.9	267.8	304.9	374.3	369.3	429.8	476.0	468.0	426.0	567.0	101.5	389.3	0.2607
Artesian Resources Corporation	7.3	7.6	6.7	9.8	8.3	9.5	11.3	13.0	14.0	14.3	2.7	10.2	0.2635
California Water Service Group	40.6	37.7	36.1	42.6	47.3	56.7	45.0	48.7	67.2	65.6	10.4	48.8	0.2142
Middlesex Water Co.	10.0	14.3	13.4	14.4	16.6	18.4	20.0	22.7	22.8	32.5	6.1	18.5	0.3289
SIW Corp.	15.2	15.8	20.9	22.3	23.5	51.8	37.9	52.8	59.2	38.8	15.6	33.8	0.4625
York Water Co.	7.5	8.9	9.1	9.3	9.7	11.5	12.5	11.8	13.0	13.4	1.9	10.7	0.1794
												Mean	0.2756
												Median	0.2607

Proxy Group of Thirteen Non-Price Regulated Companies	Net Profit (millions)										Standard Deviation	Mean	Coefficient of Variation
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018			
AutoZone Inc.	\$ 557.1	\$ 738.3	\$ 849.0	\$ 930.4	\$ 1,016.5	\$ 1,069.7	\$ 1,160.2	\$ 1,241.0	\$ 1,280.9	\$ 1,406.3	\$ 231.2	\$ 1,034.9	0.2234
Bunge Ltd.	361.0	525.0	900.0	679.8	784.3	483.0	756.0	754.0	246.0	257.0	221.7	574.6	0.3858
Cheesecake Factory	58.8	86.1	95.1	103.8	114.0	101.7	120.1	139.6	125.1	112.3	21.4	105.7	0.2021
Casey's Gen'l Stores	117.0	94.6	116.8	110.6	134.5	183.0	226.0	177.5	143.0	203.9	42.0	150.7	0.2786
Cboe Global Markets	107.8	99.4	139.4	157.4	176.0	189.7	205.0	185.7	400.6	425.2	107.3	208.6	0.5146
Cracker Barrel	66.0	85.3	91.1	107.9	119.0	135.1	163.9	189.3	201.9	222.2	50.9	138.2	0.3684
Dollar General	339.4	627.9	766.7	952.7	1,025.1	1,065.3	1,165.1	1,251.1	1,228.2	1,589.5	335.6	1,001.1	0.3352
Dunkin' Brands Group	NA	95.9	101.7	149.7	165.8	186.4	188.0	208.7	223.8	246.3	48.6	174.0	0.2792
Darden Restaurants	381.5	414.2	478.7	476.5	412.6	183.2	342.9	456.6	504.5	606.2	106.3	425.7	0.2498
Integra LifeSciences	63.5	89.9	82.2	87.2	70.6	97.6	102.2	135.3	153.4	203.5	41.1	108.5	0.3784
Lamb Weston Holdings	NA	NA	NA	NA	NA	NA	NA	NA	326.9	416.8	44.9	371.9	0.1209
Texas Roadhouse	47.5	58.3	64.0	74.2	80.4	87.0	96.9	120.1	140.7	158.2	34.6	92.7	0.3726
Viad Corp.	(2.2)	3.6	11.3	22.0	25.5	32.1	29.4	48.9	53.5	47.7	18.2	27.2	0.6699
												Mean	0.3568
												Median	0.3518

NA = Not Available  
Bold figures indicate estimates

Source of Information:  
Value Line Investment Survey



**Blue Granite Water Company**  
Basis of Selection of Non-Price Regulated Proxy Groups  
Comparable in Total Risk to Utility Proxy Groups

Parcel Value Line Water Group	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta	Non-Utility Group Comparable to DCP VL Group	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
Amer. States Water	0.70	0.52	2.7606	0.1051	AutoZone Inc.	0.80	0.68	2.8167	0.1072
Amer. Water Works	0.55	0.31	2.0671	0.0787	Cheesecake Factory	0.70	0.54	2.8539	0.1087
Aqua America	0.70	0.48	2.2102	0.0841	Casey's Gen'l Stores	0.70	0.52	3.0696	0.1169
Artesian Res Corp	0.60	0.35	3.3330	0.1269	Choe Global Markets	0.70	0.52	2.8145	0.1072
California Water	0.70	0.54	2.8259	0.1076	Cracker Barrel	0.75	0.59	3.0393	0.1157
Middlesex Water	0.75	0.55	3.2001	0.1218	Campbell Soup	0.65	0.42	2.6472	0.1008
SIW Group	0.60	0.37	3.2738	0.1246	Dollar General	0.80	0.67	3.0401	0.1157
York Water Co. (The)	0.75	0.56	3.3903	0.1291	Dunkin' Brands Group	0.60	0.38	2.7913	0.1063
Average	0.67	0.46	2.8826	0.1097	Darden Restaurants	0.80	0.64	2.9354	0.1118
					Forrester Research	0.75	0.57	2.6369	0.1004
					Hormel Foods	0.65	0.47	2.6420	0.1006
Beta Range (+/- 2 std. Devs. of Beta)	0.24	0.68			Integra LifeSciences	0.80	0.64	3.0015	0.1143
2 std. Devs. of Beta	0.22				Lamb Weston Holdings	0.75	0.57	2.7437	0.1768
					Vail Resorts	0.80	0.65	2.6758	0.1019
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.6292	3.1360			Viad Corp.	0.80	0.64	3.0650	0.1167
Std. dev. of the Res. Std. Err.	0.1267				Average	0.74	0.57	2.8515	0.1134
2 std. devs. of the Res. Std. Err.	0.2534								

Source of Information: Value Line Proprietary Database - December 2019

**Blue Granite Water Company**  
Basis of Selection of Non-Price Regulated Proxy Groups  
Comparable in Total Risk to Utility Proxy Groups

Parcel Water Group	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta	Non-Utility Group Comparable to DCP Group	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
Amer. States Water	0.70	0.52	2.7606	0.1051	AutoZone Inc.	0.80	0.68	2.8167	0.1072
Amer. Water Works	0.55	0.31	2.0671	0.0787	Cheesecake Factory	0.70	0.54	2.8539	0.1087
California Water	0.70	0.54	2.8259	0.1076	Casey's Gen'l Stores	0.70	0.52	3.0696	0.1169
Middlesex Water	0.75	0.55	3.2001	0.1218	Choe Global Markets	0.70	0.52	2.8145	0.1072
York Water Co. (The)	0.75	0.56	3.3903	0.1291	Cracker Barrel	0.75	0.59	3.0393	0.1157
					C.H. Robinson	0.80	0.69	2.6005	0.0990
Average	0.69	0.50	2.8488	0.1085	Campbell Soup	0.65	0.42	2.6472	0.1008
					Dollar General	0.80	0.67	3.0401	0.1157
Beta Range (+/- 2 std. Devs. of Beta)	0.28	0.72			Dunkin' Brands Group	0.60	0.38	2.7913	0.1063
2 std. Devs. of Beta	0.22				Darden Restaurants	0.80	0.64	2.9354	0.1118
					Elbit Systems	0.85	0.71	2.7065	0.1030
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.5984	3.0992			Forrester Research	0.75	0.57	2.6369	0.1004
					Hormel Foods	0.65	0.47	2.6420	0.1006
Std. dev. of the Res. Std. Err.	0.1252				Integra LifeSciences	0.80	0.64	3.0015	0.1143
2 std. devs. of the Res. Std. Err.	0.2504				Lamb Weston Holdings	0.75	0.57	2.7437	0.1768
					Mercury General	0.85	0.72	2.7184	0.1035
					Vail Resorts	0.80	0.65	2.6758	0.1019
					NVR, Inc.	0.85	0.72	2.8873	0.1099
					Philip Morris Int'l	0.80	0.62	2.5997	0.0990
					Texas Roadhouse	0.80	0.69	3.0305	0.1154
					Viad Corp.	0.80	0.64	3.0650	0.1167
Source of Information: Value Line Proprietary Database - December 2019						0.76	0.60	2.8246	0.1110

D'Ascendis Water Group	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta	Non-Utility Group Comparable to DWD Group	Value Line Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression	Standard Deviation of Beta
Amer. States Water	0.70	0.52	2.7606	0.1051	AutoZone Inc.	0.80	0.68	2.8167	0.1072
Amer. Water Works	0.55	0.31	2.0671	0.0787	Cheesecake Factory	0.70	0.54	2.8539	0.1087
Artesian Res Corp	0.60	0.35	3.3330	0.1269	Casey's Gen'l Stores	0.70	0.52	3.0696	0.1169
California Water	0.70	0.54	2.8259	0.1076	Cboe Global Markets	0.70	0.52	2.8145	0.1072
Middlesex Water	0.75	0.55	3.2001	0.1218	Cracker Barrel	0.75	0.59	3.0393	0.1157
York Water Co. (The)	0.75	0.56	3.3903	0.1291	Dollar General	0.80	0.67	3.0401	0.1157
					Dunkin' Brands Group	0.60	0.38	2.7913	0.1063
Average	0.68	0.47	2.9295	0.1115	Darden Restaurants	0.80	0.64	2.9354	0.1118
					Integra LifeSciences	0.80	0.64	3.0015	0.1143
Beta Range (+/- 2 std. Devs. of Beta)	0.25	0.69			Lamb Weston Holdings	0.75	0.57	2.7437	0.1768
2 std. Devs. of Beta	0.22				Vail Resorts	0.80	0.65	2.6758	0.1019
					Texas Roadhouse	0.80	0.69	3.0305	0.1154
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	2.6721	3.1869			Viad Corp.	0.80	0.64	3.0650	0.1167
						0.75	0.59	2.9136	0.1165

Source of Information: Value Line Proprietary Database - December 2019

Blue Granite Water Company  
Summary of Cost of Common Equity Models Applied to  
Non-Regulated Proxy Groups Comparable in Total Risk  
to Mr. Parcell's Proxy Groups

<u>Principal Methods</u>	<u>Non-Utility Group Comparable to DCP VL Group</u>	<u>Non-Utility Group Comparable to DCP Group</u>	<u>Non-Utility Group Comparable to DWD Group</u>
Discounted Cash Flow Model (DCF) (1)	10.1%	11.8%	10.8%
Capital Asset Pricing Model (CAPM) (2)	<u>10.6%</u>	<u>10.7%</u>	<u>10.7%</u>
	<u>10.4%</u>	<u>11.3%</u>	<u>10.7%</u>

Notes:

- (1) From page 2 of this Schedule.
- (2) From page 3 of this Schedule.

PROXY COMPANIES  
DCF COST RATES

COMPANY	ADJUSTED YIELD	HISTORIC RETENTION GROWTH	PROSPECTIVE RETENTION GROWTH	HISTORIC PER SHARE GROWTH	PROSPECTIVE PER SHARE GROWTH	FIRST CALL EPS GROWTH	AVERAGE GROWTH	DCF RATES
<b>Non-Utility Group Comparable to DCP VL Group</b>								
AutoZone Inc.	0.0%	NMF	NMF	14.0%	13.5%	11.0%	12.8%	NA
Cheesecake Factory	3.7%	13.1%	11.8%	14.7%	7.5%	8.1%	11.0%	14.7%
Casey's Gen'l Stores	0.8%	13.3%	11.3%	13.7%	6.5%	10.3%	11.0%	11.8%
Cboe Global Markets	1.3%	30.3%	8.2%	23.3%	14.5%	2.2%	15.7%	17.0%
Cracker Barrel	3.5%	15.0%	16.5%	15.8%	10.8%	neg	14.5%	18.1%
Campbell Soup	3.1%	31.0%	24.3%	4.8%	5.2%	7.4%	14.5%	17.7%
Dollar General	0.9%	17.8%	20.5%	10.3%	9.5%	10.8%	13.8%	14.6%
Dunkin' Brands Group	2.1%	24.4%	NMF	23.0%	9.8%	7.9%	16.3%	18.4%
Darden Restaurants	3.2%	9.1%	15.0%	7.0%	9.7%	8.7%	9.9%	13.1%
Forrester Research	0.0%	6.4%	11.8%	3.3%	10.3%	12.0%	8.8%	NA
Hormel Foods	2.3%	11.4%	9.2%	13.8%	8.7%	3.2%	9.3%	11.5%
Integra LifeSciences	0.0%	14.9%	17.8%	7.3%	9.5%	13.2%	12.5%	NA
Lamb Weston Holdings	1.2%	NMF	NMF	NA	13.3%	7.4%	10.3%	11.5%
Vail Resorts	3.2%	4.9%	6.0%	35.2%	16.3%	7.4%	14.0%	17.1%
Viad Corp.	0.6%	8.9%	10.2%	10.0%	9.3%	14.0%	10.5%	11.1%
Mean	1.7%	15.4%	13.6%	14.0%	10.3%	8.8%	12.3%	14.7%
Median	1.3%	13.3%	11.8%	13.8%	9.7%	8.4%	12.5%	14.7%
Composite - Mean		17.2%	15.3%	15.7%	12.0%	10.6%	14.1%	
Composite - Median		14.7%	13.1%	15.1%	11.0%	9.7%	13.8%	
<b>Non-Utility Group Comparable to DCP Group</b>								
AutoZone Inc.	0.0%	NMF	NMF	14.0%	13.5%	11.0%	12.8%	NA
Cheesecake Factory	3.7%	13.1%	11.8%	14.7%	7.5%	8.1%	11.0%	14.7%
Casey's Gen'l Stores	0.8%	13.3%	11.3%	13.7%	6.5%	10.3%	11.0%	11.8%
Cboe Global Markets	1.3%	30.3%	8.2%	23.3%	14.5%	2.2%	15.7%	17.0%
Cracker Barrel	3.5%	15.0%	16.5%	15.8%	10.8%	neg	14.5%	18.1%
C.H. Robinson	2.6%	21.8%	19.2%	5.7%	9.8%	5.5%	12.4%	15.0%
Campbell Soup	3.1%	31.0%	24.3%	4.8%	5.2%	7.4%	14.5%	17.7%
Dollar General	0.9%	17.8%	20.5%	10.3%	9.5%	10.8%	13.8%	14.6%
Dunkin' Brands Group	2.1%	24.4%	NMF	23.0%	9.8%	7.9%	16.3%	18.4%
Darden Restaurants	3.2%	9.1%	15.0%	7.0%	9.7%	8.7%	9.9%	13.1%
Elbit Systems	1.1%	9.7%	8.0%	9.0%	7.5%	10.9%	9.0%	10.2%
Forrester Research	0.0%	6.4%	11.8%	9.0%	10.3%	12.0%	9.9%	NA
Hormel Foods	2.3%	11.4%	17.8%	13.8%	8.7%	3.2%	11.0%	13.3%
Integra LifeSciences	0.0%	14.9%	17.8%	7.3%	9.5%	13.2%	12.5%	NA
Lamb Weston Holdings	1.2%	NMF	NMF	NA	13.3%	7.4%	10.3%	11.5%
Mercury General	5.4%	NMF	4.5%	neg	9.7%	37.9%	17.4%	22.7%
Vail Resorts	3.2%	4.9%	6.0%	35.2%	16.3%	9.2%	14.3%	17.5%
NVR, Inc.	0.0%	33.2%	34.0%	19.5%	12.5%	10.8%	22.0%	NA
Phillip Morris Int'l	5.9%	NMF	NMF	2.3%	5.3%	6.0%	4.5%	10.4%
Texas Roadhouse	2.3%	9.0%	11.0%	13.5%	12.7%	9.1%	11.1%	13.4%
Viad Corp.	0.6%	8.9%	10.2%	10.0%	9.3%	14.0%	10.5%	11.1%
Mean	2.1%	16.1%	14.6%	13.3%	10.1%	10.3%	12.6%	14.7%
Median	2.1%	13.3%	11.8%	13.5%	9.7%	9.2%	12.4%	14.6%
Composite - Mean		18.2%	16.6%	15.3%	12.1%	12.3%	14.7%	
Composite - Median		15.5%	14.0%	15.6%	11.8%	11.3%	14.5%	
<b>Non-Utility Group Comparable to DWD Group</b>								
AutoZone Inc.	0.0%	NMF	NMF	14.0%	13.5%	11.0%	12.8%	12.8%
Cheesecake Factory	3.7%	13.1%	11.8%	14.7%	7.5%	8.1%	11.0%	14.7%
Casey's Gen'l Stores	0.8%	13.3%	11.3%	13.7%	6.5%	10.3%	11.0%	11.8%
Cboe Global Markets	1.3%	30.3%	8.2%	23.3%	14.5%	2.2%	15.7%	17.0%
Cracker Barrel	3.5%	15.0%	16.5%	15.8%	10.8%	neg	14.5%	18.1%
Dollar General	0.9%	17.8%	20.5%	10.3%	9.5%	10.8%	13.8%	14.6%
Dunkin' Brands Group	2.1%	24.4%	NMF	23.0%	9.8%	7.9%	16.3%	18.4%
Darden Restaurants	3.2%	9.1%	15.0%	7.0%	9.7%	8.7%	9.9%	13.1%
Integra LifeSciences	0.0%	14.9%	17.8%	7.3%	9.5%	13.2%	12.5%	12.5%
Lamb Weston Holdings	1.2%	NMF	NMF	NA	13.3%	7.4%	10.3%	11.5%
Vail Resorts	3.2%	4.9%	6.0%	35.2%	16.3%	9.2%	14.3%	17.5%
Texas Roadhouse	2.3%	9.0%	11.0%	13.5%	12.7%	9.1%	11.1%	13.4%
Viad Corp.	0.6%	8.9%	10.2%	10.0%	9.3%	14.0%	10.5%	11.1%
Mean	1.8%	14.6%	12.8%	15.6%	11.0%	9.3%	12.6%	14.4%
Median	1.3%	13.3%	11.6%	13.8%	9.8%	9.2%	12.5%	13.4%
Composite - Mean		16.4%	14.6%	17.4%	12.8%	11.1%	14.4%	
Composite - Median		14.7%	12.9%	15.1%	11.1%	10.5%	13.8%	

Note: negative values not used in calculations.

PROXY COMPANIES  
CAPM COST RATES

COMPANY	RISK-FREE RATE	BETA	RISK PREMIUM	CAPM RATES	ECAPM RATES	AVERAGE
<b>Non-Utility Group Comparable to DCP VL Group</b>						
AutoZone Inc.	2.70%	0.80	9.75%	10.5%	11.0%	
Cheesecake Factory	2.70%	0.80	9.75%	10.5%	11.0%	
Casey's Gen'l Stores	2.70%	0.75	9.75%	10.0%	10.6%	
Cboe Global Markets	2.70%	0.70	9.75%	9.5%	10.3%	
Cracker Barrel	2.70%	0.75	9.75%	10.0%	10.6%	
Campbell Soup	2.70%	0.65	9.75%	9.0%	9.9%	
Dollar General	2.70%	0.85	9.75%	11.0%	11.4%	
Dunkin' Brands Group	2.70%	0.70	9.75%	9.5%	10.3%	
Darden Restaurants	2.70%	0.80	9.75%	10.5%	11.0%	
Forrester Research	2.70%	0.85	9.75%	11.0%	11.4%	
Hormel Foods	2.70%	0.65	9.75%	9.0%	9.9%	
Integra LifeSciences	2.70%	0.85	9.75%	11.0%	11.4%	
Lamb Weston Holdings	2.70%	0.70	9.75%	9.5%	10.3%	
Vail Resorts	2.70%	0.90	9.75%	11.5%	11.7%	
Viad Corp.	2.70%	0.80	9.75%	10.5%	11.0%	
Mean				10.2%	10.8%	10.5%
Median				10.5%	11.0%	10.7%
<b>Non-Utility Group Comparable to DCP Group</b>						
AutoZone Inc.	2.70%	0.80	9.75%	10.5%	11.0%	
Cheesecake Factory	2.70%	0.80	9.75%	10.5%	11.0%	
Casey's Gen'l Stores	2.70%	0.75	9.75%	10.0%	10.6%	
Cboe Global Markets	2.70%	0.70	9.75%	9.5%	10.3%	
Cracker Barrel	2.70%	0.75	9.75%	10.0%	10.6%	
C.H. Robinson	2.70%	0.90	9.75%	11.5%	11.7%	
Campbell Soup	2.70%	0.65	9.75%	9.0%	9.9%	
Dollar General	2.70%	0.85	9.75%	11.0%	11.4%	
Dunkin' Brands Group	2.70%	0.70	9.75%	9.5%	10.3%	
Darden Restaurants	2.70%	0.80	9.75%	10.5%	11.0%	
Elbit Systems	2.70%	0.85	9.75%	11.0%	11.4%	
Forrester Research	2.70%	0.85	9.75%	11.0%	11.4%	
Hormel Foods	2.70%	0.65	9.75%	9.0%	9.9%	
Integra LifeSciences	2.70%	0.85	9.75%	11.0%	11.4%	
Lamb Weston Holdings	2.70%	0.70	9.75%	9.5%	10.3%	
Mercury General	2.70%	0.90	9.75%	11.5%	11.7%	
Vail Resorts	2.70%	0.90	9.75%	11.5%	11.7%	
NVR, Inc.	2.70%	0.80	9.75%	10.5%	11.0%	
Philip Morris Int'l	2.70%	0.85	9.75%	11.0%	11.4%	
Texas Roadhouse	2.70%	0.80	9.75%	10.5%	11.0%	
Viad Corp.	2.70%	0.80	9.75%	10.5%	11.0%	
Mean				10.4%	10.9%	10.7%
Median				10.5%	11.0%	10.7%
<b>Non-Utility Group Comparable to DWD Group</b>						
AutoZone Inc.	2.70%	0.80	9.75%	10.5%	11.0%	
Cheesecake Factory	2.70%	0.80	9.75%	10.5%	11.0%	
Casey's Gen'l Stores	2.70%	0.75	9.75%	10.0%	10.6%	
Cboe Global Markets	2.70%	0.70	9.75%	9.5%	10.3%	
Cracker Barrel	2.70%	0.75	9.75%	10.0%	10.6%	
Dollar General	2.70%	0.85	9.75%	11.0%	11.4%	
Dunkin' Brands Group	2.70%	0.70	9.75%	9.5%	10.3%	
Darden Restaurants	2.70%	0.80	9.75%	10.5%	11.0%	
Integra LifeSciences	2.70%	0.85	9.75%	11.0%	11.4%	
Lamb Weston Holdings	2.70%	0.70	9.75%	9.5%	10.3%	
Vail Resorts	2.70%	0.90	9.75%	11.5%	11.7%	
Texas Roadhouse	2.70%	0.80	9.75%	10.5%	11.0%	
Viad Corp.	2.70%	0.80	9.75%	10.5%	11.0%	
Mean				10.4%	10.9%	10.6%
Median				10.5%	11.0%	10.7%

Blue Granite Water Company  
Derivation of Investment Risk Adjustment Based upon  
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

Line No.		[1]	[2]	[3]	[4]
		Market Capitalization on October 18, 2019 (1) ( millions )	Applicable Decile of the NYSE/AMEX/NASDAQ (2)	Applicable Size Premium (3)	Spread from Applicable Size Premium (4)
		(times larger)			
1.	BGWC - Based upon Parcel VL Water Group	\$ 64,016	10	5.22%	
2.	BGWC - Based upon Parcel Water Group	\$ 73,270	10	5.22%	
3.	BGWC - Based upon Parcel DWD Group	\$ 67,348	10	5.22%	
4.	Parcel VL Water Group	\$ 5,027,717	78.5 x	0.85%	4.37%
5.	Parcel Water Group	\$ 5,899,902	80.5 x	0.85%	4.37%
6.	Parcel DWD Group	\$ 4,973,951	73.9 x	0.85%	4.37%

Decile	Market Capitalization of Smallest Company ( millions )	Market Capitalization of Largest Company ( millions )	Size Premium (Return in Excess of CAPM)*
1	\$ 29,428,909	\$ 1,073,390,566	-0.30%
2	13,512,960	29,022,867	0.52%
3	7,275,967	13,455,802	0.81%
4	4,504,066	7,524,230	0.85%
5	2,996,003	4,503,549	1.28%
6	1,961,831	2,992,251	1.50%
7	1,292,791	1,960,201	1.58%
8	730,047	1,292,224	1.80%
9	325,360	727,843	2.46%
10	2,455	321,578	5.22%

\*From 2019 Duff & Phelps Cost of Capital Navigator

Notes:

- (1) From page 2 of this Schedule.
- (2) Gleaned from Columns [B] and [C] on the bottom of this page. The appropriate decile (Column [A]) corresponds to the market capitalization of the proxy group, which is found in Column [1].
- (3) Corresponding risk premium to the decile is provided in Column [D] on the bottom of this page.
- (4) Line No. 4 Column [3] - Line No. 2 Column [3]. For example, the 4.37% in Column [4], Line No. 2 is derived as follows 4.37% = 5.22% - 0.85%.

Blue Granite Water Company  
Market Capitalization of Blue Granite Water Company  
and Mr. Parcell's Proxy Groups

	[1]	[2]	[3]	[4]	[5]	[6]
Company	Common Stock Shares Outstanding at Fiscal Year End 2018 (millions)	Book Value per Share at Fiscal Year End 2018 (1)	Total Common Equity at Fiscal Year End 2018 (millions)	Closing Stock Market Price on December 31, 2019	Market-to- Book Ratio on December 31, 2019 (2)	Market Capitalization on December 31, 2019 (3) (millions)
Blue Granite Water Company	NA	NA	\$ 16,802 (4)	NA		
Based upon Parcell VL Water Group (5)					381.0 (6)	\$ 64,016 (7)
Based upon Parcell Water Group (5)					436.1 (6)	\$ 73,270 (7)
Based upon Parcell DWD Group (5)					400.8 (6)	\$ 67,348 (7)
Parcell Proxy Group Companies						
American States Water Co.	36,758	\$ 15.187	\$ 558,223	\$ 86,640	570.5 %	\$ 3,184,699
American Water Works Company Inc	180,684	32.454	5,864,000	122,850	378.5	22,197,030
Aqua America, Inc.	178,092	11.283	2,009,364	46,940	416.0	8,359,621
Artesian Resources Corporation	9,250	16.568	153,251	37,210	224.6	344,193
California Water Service Group	48,065	15.191	730,157	51,560	339.4	2,478,216
Middlesex Water Co.	16,403	15.167	248,787	63,570	419.1	1,042,739
SIW Corp.	28,404	31.309	889,312	71,060	227.0	2,018,411
York Water Co.	12,944	9.750	126,195	46,110	472.9	596,826
Average - Parcell VL Water Group	63,925	\$ 18,364	\$ 1,322,411	\$ 65,743	381.0 %	\$ 5,027,717
Average - Parcell Water Group	58,971	\$ 17,550	\$ 1,505,472	\$ 74,146	436.1 %	\$ 5,899,902
Average - Parcell DWD Group	50,684	\$ 17,386	\$ 1,280,102	\$ 67,990	400.8 %	\$ 4,973,951

NA= Not Available

Notes: (1) Column 3 / Column 1.  
(2) Column 4 / Column 2.  
(3) Column 1 \* Column 4.

(4) Book common equity multiplied by requested equity ratio.

(5) Mr. Parcell's proxy groups are detailed in Exhibit DCP-2, Schedules 4, 5, 6, 8, 9, and 11.

(6) The market-to-book ratio of Blue Granite Water Company on December 31, 2019 is assumed to be equal to the market-to-book ratio of each proxy group on December 31, 2019 as appropriate.

(7) Column [3] multiplied by Column [5].

Source of Information: 2018 Annual Forms 10K  
yahoo.finance.com



Blue Granite Water Company  
Portfolio Ranks by Size and Risk Premiums over CAPM Results  
as Compiled by Duff and Phelps 2019 Guide to Cost of Capital

Portfolio Rank by Size	B-1 Market Val. of Equity (in \$millions)	Smoothed Premium over CAPM	B-2 Average Book Val. (in \$millions)	Smoothed Premium over CAPM	B-4 Market Value of Invested Capital (in \$millions)	Smoothed Premium over CAPM	B-5 Total Assets (in \$millions)	Smoothed Premium over CAPM	B-7 Sales (in \$millions)	Smoothed Premium over CAPM	B-8 Average Number of Employees	Smoothed Premium over CAPM
1	\$183,530 and Up	-1.58%	\$39,064 and Up	0.70%	\$218,547 and Up	-0.91%	\$118,454 and Up	0.42%	\$83,836 and Up	0.66%	224,700 and Up	0.32%
2	\$58,770 - \$183,530	-0.17%	\$14,329 - \$39,064	1.38%	\$76,098 - \$218,547	0.17%	\$49,025 - \$118,454	1.13%	\$30,694 - \$83,836	1.41%	87,395 - 224,700	1.17%
3	\$36,102 - \$58,770	0.39%	\$9,398 - \$14,329	1.63%	\$46,827 - \$76,098	0.65%	\$32,779 - \$49,025	1.40%	\$18,880 - \$30,694	1.81%	58,282 - 87,395	1.52%
4	\$25,511 - \$36,102	0.79%	\$6,536 - \$9,398	1.83%	\$33,869 - \$46,827	0.97%	\$22,606 - \$32,779	1.65%	\$14,299 - \$18,880	1.99%	44,136 - 58,282	1.75%
5	\$19,083 - \$25,511	1.08%	\$4,972 - \$6,536	2.02%	\$25,989 - \$33,869	1.19%	\$16,793 - \$22,606	1.87%	\$11,160 - \$14,299	2.17%	34,651 - 44,136	1.92%
6	\$14,850 - \$19,083	1.39%	\$4,216 - \$4,972	2.12%	\$20,123 - \$25,989	1.43%	\$13,244 - \$16,793	2.02%	\$9,136 - \$11,160	2.31%	27,046 - 34,651	2.10%
7	\$12,298 - \$14,850	1.58%	\$3,539 - \$4,216	2.20%	\$16,237 - \$20,123	1.62%	\$10,530 - \$13,244	2.18%	\$7,727 - \$9,136	2.43%	21,476 - 27,046	2.29%
8	\$10,226 - \$12,298	1.78%	\$2,887 - \$3,539	2.32%	\$13,373 - \$16,237	1.80%	\$8,750 - \$10,530	2.31%	\$6,699 - \$7,727	2.52%	17,789 - 21,476	2.44%
9	\$8,627 - \$10,226	1.96%	\$2,403 - \$2,887	2.42%	\$11,285 - \$13,373	1.96%	\$7,383 - \$8,750	2.42%	\$5,696 - \$6,699	2.61%	15,100 - 17,789	2.57%
10	\$7,351 - \$8,627	2.12%	\$2,055 - \$2,403	2.52%	\$9,706 - \$11,285	2.09%	\$6,290 - \$7,383	2.53%	\$4,671 - \$5,696	2.73%	13,149 - 15,100	2.68%
11	\$6,241 - \$7,351	2.29%	\$1,799 - \$2,055	2.59%	\$8,264 - \$9,706	2.21%	\$5,360 - \$6,290	2.62%	\$3,861 - \$4,671	2.87%	11,535 - 13,149	2.77%
12	\$5,361 - \$6,241	2.46%	\$1,588 - \$1,799	2.66%	\$6,974 - \$8,264	2.37%	\$4,546 - \$5,360	2.73%	\$3,312 - \$3,861	2.97%	10,137 - 11,535	2.87%
13	\$4,586 - \$5,361	2.60%	\$1,400 - \$1,588	2.73%	\$6,030 - \$6,974	2.50%	\$3,885 - \$4,546	2.83%	\$2,867 - \$3,312	3.07%	8,921 - 10,137	2.96%
14	\$3,853 - \$4,586	2.79%	\$1,230 - \$1,400	2.80%	\$5,227 - \$6,030	2.61%	\$3,273 - \$3,885	2.93%	\$2,506 - \$2,867	3.16%	7,763 - 8,921	3.06%
15	\$3,319 - \$3,853	2.95%	\$1,069 - \$1,230	2.87%	\$4,488 - \$5,227	2.75%	\$2,780 - \$3,273	3.05%	\$2,209 - \$2,506	3.24%	6,656 - 7,763	3.16%
16	\$2,915 - \$3,319	3.09%	\$930 - \$1,069	2.95%	\$3,887 - \$4,488	2.87%	\$2,423 - \$2,780	3.14%	\$1,944 - \$2,209	3.32%	5,574 - 6,656	3.29%
17	\$2,530 - \$2,915	3.22%	\$811 - \$930	3.02%	\$3,305 - \$3,887	3.00%	\$2,092 - \$2,423	3.23%	\$1,723 - \$1,944	3.41%	4,653 - 5,574	3.42%
18	\$2,120 - \$2,530	3.38%	\$686 - \$811	3.10%	\$2,707 - \$3,305	3.16%	\$1,750 - \$2,092	3.33%	\$1,526 - \$1,723	3.48%	3,852 - 4,653	3.56%
19	\$1,713 - \$2,120	3.59%	\$574 - \$686	3.20%	\$2,178 - \$2,707	3.35%	\$1,441 - \$1,750	3.46%	\$1,278 - \$1,526	3.56%	3,145 - 3,852	3.70%
20	\$1,379 - \$1,713	3.82%	\$483 - \$574	3.30%	\$1,794 - \$2,178	3.53%	\$1,184 - \$1,441	3.58%	\$1,007 - \$1,278	3.71%	2,529 - 3,145	3.86%
21	\$1,112 - \$1,379	4.03%	\$404 - \$483	3.39%	\$1,453 - \$1,794	3.68%	\$934 - \$1,184	3.72%	\$797 - \$1,007	3.87%	1,986 - 2,529	4.02%
22	\$867 - \$1,112	4.27%	\$331 - \$404	3.49%	\$1,118 - \$1,453	3.90%	\$708 - \$934	3.89%	\$626 - \$797	4.01%	1,495 - 1,986	4.21%
23	\$633 - \$867	4.54%	\$256 - \$331	3.61%	\$807 - \$1,118	4.13%	\$512 - \$708	4.07%	\$460 - \$626	4.19%	1,079 - 1,495	4.45%
24	\$334 - \$633	4.94%	\$150 - \$256	3.78%	\$416 - \$807	4.48%	\$287 - \$512	4.31%	\$247 - \$460	4.42%	595 - 1,079	4.69%
25	Up to \$334	6.15%	Up to \$150	4.31%	Up to \$416	5.54%	Up to \$287	4.94%	Up to \$247	5.17%	Up to 595	5.53%

Portfolio Rank	B-1 Value	Portfolio Ranking	B-2 Value	Portfolio Ranking	B-4 Value	Portfolio Ranking	B-5 Value	Portfolio Ranking	B-7 Value	Portfolio Ranking	B-8 Value	Portfolio Ranking
Parcell VL Water Group	\$ 5,028	13	\$ 1,242	14	\$ 6,607	13	\$ 4,516	13	\$ 760	22	1,471	23
Parcell Water Group	5,900	13	735	18	7,788	12	5,335	12	952	21	1,908	22
Parcell DWD Group	4,974	13	638	19	6,567	13	4,534	13	807	21	1,630	22
Blue Granite Water Company	64	25	32	25	83	25	310	24	10	25	178	25
Indicated RP - Parcell VL Water Group	3.55%		1.51%		3.04%		1.48%		1.16%		1.08%	
Indicated RP - Parcell Water Group	3.55%		1.21%		3.17%		1.58%		1.30%		1.32%	
Indicated RP - Parcell DWD Group	3.55%		1.11%		3.04%		1.48%		1.30%		1.32%	

Sources of Information:  
Duff & Phelps 2019 Cost of Capital Navigator  
SNL Financial  
Company Form 10-K  
Company Annual Reports

**CONSTANT GROWTH DISCOUNTED CASH FLOW (DCF) - INDICATED COST OF EQUITY**  
**Water Proxy Group (6 Companies)**

		<b>Based on Average Market Price For Year Ending 12/31/2019</b>	<b>Based On Market Price As Of 12/31/2019</b>
1 Dividend Yield On Market Price	[A]	1.78%	1.60%
2 Retention Rate:			
a) Market-to-Book Ratio	[A]	3.74	3.99
b) Dividend Yield on Book	[B]	6.65%	6.38%
c) Expected Return on Equity	[C]	11.85%	11.20%
d) Retention Rate	[D]	43.91%	43.08%
3 Reinvestment Growth	[E]	5.20%	4.82%
4 New Financing Growth	[F]	2.75%	3.00%
5 Total Estimate of Investor Anticipated Growth	[G]	7.95%	7.82%
6 Increment to Dividend Yield for Growth to Next Year	[H]	0.07%	0.06%
<b>7 Indicated Cost of Equity</b>	<b>[I]</b>	<b>9.80%</b>	<b>9.48%</b>

Sources:

[A] Exhibit ALR 2, Page 2

[B] Line 1 x Line 2a

[C] Some of the considerations for determining Future Expected Return on Equity:

	<u>Median</u>	<u>Mean</u>	<u>From</u>
Value Line Expectation	<b>13.00%</b>	<b>12.75%</b>	EXHIBIT ALR 2, page 3
Return on Equity to Achieve <u>Zacks</u> Growth	10.93%	11.16%	EXHIBIT ALR 2, page 4
Earned Return on Equity in 2018	10.50%	10.82%	EXHIBIT ALR 2, page 3
Earned Return on Equity in 2017	10.59%	10.86%	EXHIBIT ALR 2, page 3
Earned Return on Equity in 2016	10.57%	10.51%	EXHIBIT ALR 2, page 3

[D] 1 - Line 2b / Line 2c

[E] Line 2c x Line 2d

[F]  $S \times V = (\text{Ext. Fin Rate}) \times (\text{Line 2a} - 1)$

Ext. Fin. Rate =

1.00%

From

Page 2 of this Schedule

S = rate of continuous new stock financing

V = fraction of funds raised by sale of stock that increases the book value of existing shareholders' common equity

[G] Line 3 + Line 4

[H] Line 1 x one-half of Line 5

11.96%

11.96%

[I] Line 1 + Line 5 + Line 6

**COMMON SHARES OUTSTANDING AND EXTERNAL FINANCING RATE**  
**Water Proxy Group**

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
	<b>Common Stock Outstanding (Millions of Shares)</b>								<b>Annual Growth Rate</b>		
	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2022-2024</b>	<b>2014-18</b>	<b>2018-23</b>	<b>2014-23</b>
American States Water	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[B]	[B]	[B]
American Water Works Co., Inc	38.3	36.5	36.6	36.7	36.8	36.9	37.0	37.5	-1.01%	0.40%	-0.23%
Aqua America	179.5	178.3	178.1	178.4	180.7	181.0	182.0	189.0	0.17%	0.90%	0.58%
California Water Serv. Grp.	178.6	176.5	177.4	177.7	178.1	216.0	217.0	220.0	-0.07%	4.32%	2.34%
Middlesex Water Company	47.8	47.9	48.0	48.0	48.1	48.5	49.0	50.0	0.14%	0.79%	0.50%
York Water Company	16.1	16.2	16.3	16.4	16.4	16.7	16.8	17.0	0.43%	0.72%	0.59%
	12.8	12.8	12.9	12.9	12.9	13.0	12.9	12.8	0.21%	-0.22%	-0.03%
Maximum	179.5	178.3	178.1	178.4	180.7	216.0	217.0	220.0	0.43%	4.32%	2.34%
Minimum	12.8	12.8	12.9	12.9	12.9	13.0	12.9	12.8	-1.01%	-0.22%	-0.23%
Median	43.1	42.2	42.3	42.3	42.4	42.7	43.0	43.8	0.15%	0.76%	0.58%
<b>Average</b>	78.9	78.0	78.2	78.3	78.8	85.3	85.8	87.7	-0.02%	1.15%	1.00%
	<b>Sustainable Growth [C]</b>								<b>1.00%</b>		

Sources:

- [A] Value Line: Most current data available at time of schedule preparation.  
[B] Annualized Growth Rate calculation; excluding negative values for 2014-18 Growth in column 10.  
[C] Estimated Sustainable Growth in Common Stock based on analysis of historical and projected growth rates.